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A STUDY OF QUESTIONING*

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PREFACE

Since Socrates the question method has occupied a prominent place in the technique of instruction. "To question well," says De Garmo (19. p. 179), "is to teach well. In the skillful use of the question more than in anything else lies the fine art of teaching." Indeed, "the art of correct questioning has a highly significant effect upon the mental development, ..." (32. pp. 331-332.)

To-day more than two-thirds of the school time is occupied with questions and answers; but unfortunately the general assumption that we know by intuition when and how to ask questions kept investigators from the study of the psychology of questioning until the dawn of this century when the genius of Alfred Binet inspired him to attempt the solution of the problem (6. p. 244). Naturally the majority of teachers whom we hire to put questions to our children ask questions for months and years without ever knowing the psychology of what they are doing, hence without ever taking into account what mental changes a question calls forth, what emotional states it arouses in the pupil's mind, how such resulting states influence the course of ideation and thinking, and so forth. If the teachers do not know anything about these changes, they are not qualified for teachers. Thus it is of prime importance for educators to study the influence of questioning upon answers and upon the mental development of the child.

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General Introduction

The question rightly used is a medium through which a teacher comes into the closest touch affectively with her pupil. The pupil's reaction-time and the mode of reaction to the given question will reveal his mental type and characteristics; for instance, whether he is of visual, auditory, motor, or mixed type; whether his temperament is sanguine, phlegmatic, melancholic, etc.; or again whether he is able to impress something upon his mind (memory) with ease or difficulty, whether he forgets quickly or slowly, whether he can retain a great mass of ideas or only scanty fragments; etc. All these analytical observations are the indispensable task of a teacher in real dynamic education; for this knowledge alone will furnish the principles of individual psychology. Care, however, should be taken that the observations be made scientifically. The teacher, through such diagnosis, will discover technique for further questioning. The question is, thus, a tool for psychological analysis and diagnosis.

Pedagogically, the purpose of questioning is manifold.

1. It is to awaken the pupils to self-activity, to stimulate them to think. It gives a teacher an opportunity for directing and training the thought processes of her pupils.

2. It is to cultivate the fine art of good expression. A habit of clear, concise and discriminating enunciation and of an agreeable intonation is one of the most attractive and highest gifts which any teacher can bestow upon a child.

3. It is a means of testing the depth of the pupil's mind. Through a series of skillful questions, the teacher brings to light the strength and weakness of his knowledge, so that she may find out his intellectual status.

If the aim of the question is to train the processes of thought and expression, what will be the result when a teacher, in one class period, say, of forty minutes, asks over eighty questions (65. p. 11) and gets as many answers? What chance can there be for orderly association and deep accurate impression of ideas, or for a complete expression of thought? Furthermore the nervous tension of the pupils under such a pressure must be considered. A new science of school hygiene has arisen which is dealing with the problem of the physical as well as mental conditions of children in order that they may be able to do more work without injury. But the question as to whether the children may not make better progress in orderly association, originality, and preciseness of thought and expression, if given more freedom and time for thinking and expressing their thought as they have when engaged in their own activities, has not yet received due consideration. Time is

required to digest impressions and translate them into clear and definite ideas. Will not a "lack of time and leisure conduce to habits of speedy, but snapshot and superficial judgment?" (20. p. 37.)

I do plead for the millions of the children who now live in agony the school years of their lives because of this dragon of misguided questioning now so universally rampant in our schools. "Every question," says Matthias (41. p. 79), "must strengthen the mental power of the pupil, sharpen his understanding, advance his knowledge, develop his speech-power. Hence one should not put any question, in which the pupil needs to think nothing or little," nor should questions be asked without giving sufficient time for purposive thinking and a complete expression of thought. Is it, however, possible to acquire the art of questioning by practice? It may be a possible attainment with practice of the most intelligent sort, but mere practice, blind and mechanical, however enthusiastic a practitioner may be, will never attain the desired end. Thousands and thousands of teachers practice questioning hourly and daily, year after year, and yet are no better off than when they began. The art of questioning can not be mastered without an accurate knowledge of its fundamental principles. In other words, mere practice is not sufficient to teach one the psychology of questioning.

From this pedagogical and psychological point of view, the writer has studied the relation between question and answer.

Experimental Results

The study of the psychology of questioning is very recent. Since Binet (6. pp. 244-324) attempted the solution of this problem, there has followed a series of experimental investigations among which the studies of Stern, Wreschner, Lipmann, Lobsien, and Borst are specially prominent.

Two methods have chiefly been used: the picture method (*Bildmethode*) and the objective method (*Wirklichkeitsmethode*). In the first the presentation of pictures, in the second objects or events of real life, are used as material in regard to which testimony (*Aussage*) is obtained in two ways: by "free spontaneous report or narrative" (*Bericht*) (62. p. 270) and by asking questions, the so-called "interrogatory" (*Verhö*) or Whipple's "deposition." Hereafter these German terms will be used.

Binet first used the picture method and tried to work out the mechanism of the personal influence of questions upon children. He began by addressing the children as follows:

"My friends, we are going to make an experiment, to dis-

cover if you have a good memory, a memory better than that of your comrades; I am going to show you a pasteboard which is here hidden behind that screen; on the pasteboard certain objects will be seen. I shall show you them for twelve seconds; twelve seconds, look at them attentively. It is a very short time, it is not a minute; a minute consists of sixty seconds; twelve seconds will pass by very quickly. It is thus necessary not to lose this precious time; make use of it in your observation of the objects very carefully, for as soon as twelve seconds elapse, I shall take the pasteboard away from you, and then I shall put a number of questions upon what you have seen. Many of the questions are upon the small details, and you are requested to answer exactly. Do you understand? Is it clear to you?" With this explanation, which, Binet says, has almost always had the effect to excite the curiosity and enthusiasm of the child, he showed the following six objects pasted on a card: a penny, a button, a stamp, a label, a photograph and a picture. The number of observers was twenty-five, all of the primary school, ranging in age from nine to twelve years.

Here the object was to provoke, in the observers, errors of the forced memory, and to discover the amount of error through imagination. Hence instead of asking their spontaneous description of each object, he first asked simply an enumeration of the objects and then put a series of questions, forty-one in all. The results were very poor compared with those obtained by other investigators, because of the very brief time of exposure. The percentage of the right and the false answers was 58.2 and 41.8 respectively. (6. pp. 262-269.)

Then the method of spontaneous narrative was tried, repeating the same test upon a different group of children without asking any questions, that is, the children simply wrote what they saw and remembered, the only recommendation being not to be contented with naming the objects, but to describe all the details. The number of the pupils tested was twelve, all of the upper class of the primary school, with the same conditions as far as possible. The results were: two pupils committed no error; two committed one error; one committed two; four, three; and three, four errors; while in the experiment of the forced memory, the minimum of error was five and the maximum was thirteen. (6. pp. 262-269.)

It is extremely probable that, if one forces the memory by suggestion, one may provoke a great number of errors. Thus Binet made three more tests by the use of the written questions. The same objects were shown as before. A number of children of ages nine to twelve were divided into

three groups and each group received a different set of the questions. The first was intended to force memory, *e. g.*, "How is the button fixed?" The second was intended to produce a moderate suggestion, *e. g.*, the form of the questions was suggestive of false affirmation, for example: "Isn't the button fastened with thread?" The third gave a strong suggestion, *e. g.*, "What is the color of the thread which passes through the holes of the button and fixes it to the card?"

As Binet expected, the majority of his observers accepted suggestions and answered as if the memory images had been true and spontaneous as is seen from the following table. (6. p. 313.)

Questionnaire		Questionnaire		Questionnaire	
I		II		III	
5 children		11 children		11 children	
r	f	r	f	r	f
8.1	2.9	8.09	4.9	5.09	7.9
73.6%	26.4%	63.3%	37.7%	39.2%	60.8%

In this and the following tables,
r equals number of items rightly reported;
f " " " falsely "
u " " " uncertain "

The surprisingly high percentage of the errors in case of the third questionnaire shows how few of the children have sufficient independence of thinking and will-power to acknowledge and refuse the false suggestions. Twelve normal school students made the same kind of errors as the children did, though not so gross. (6. pp. 325-329.)

Binet concludes as follows: A full and concise report may be made and yet be false. (6. p. 285.) The experiment of the forced memory is subjected to error more than that of the spontaneous memory (6. p. 294). The method of suggestion by the written questions is powerful enough to influence not only children under twelve, but also young people of eighteen years of age (6. p. 329), and more so with the oral questioning. Hence if you desire a faithful testimony from a child, you must not ask him any question, nor command him to make an oral report, but require him to write spontaneously what he knows, since children are, even at the age of twelve, still incapable of distinguishing between fact and fiction or

invention by imagination and reasoning. "How many adults are not grown up children in this respect!" adds Seashore in his review of Binet's *"La Suggestibilité."*

Following Binet, Stern performed several experiments on the same problem. One of them was carried out in the year 1902 with forty-seven observers of from seven to nineteen years of age of both sexes. After an introductory statement, almost the same as Binet's, Stern hands a picture, well known now as the *Bauernstube* (peasant room) to the observer to look at it attentively in bright day light for one minute, after which period he takes the picture away and asks the observer to describe what he has seen. If the observer begins to hesitate in his explanation, the experimenter says quietly: "Think of it; something may probably come to you yet." If the observer is again silent, the experimenter asks: "Does nothing occur to your mind any more?" Upon the answer: "no," the experimenter goes on: "Now I shall ask you a little more, and certainly something will come to your mind. But if you do not know any answer to the given questions, just say: 'I do not know.' It will not harm you at all, even if you do not know." Stern allowed one minute for observation in order that a thorough comprehension and better recollection might be obtained. The resistance to falsification through suggestion was thus increased. Twelve suggestive questions were mixed with the indifferent questions to divert suspicion, and the suggestive questions were, like the second questionnaire of Binet, purely "questions" that suggested the answer "yes." Each question including the suggestive one was asked only once in the most indifferent tone, and answered orally. The results are shown in the following table. (58. pp. 295-321.)

	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
				%	%
Bericht.....	24	1.5		94	6
Verhör.....	35	17.1	6.7	67	33
	in %	in %	in %		
Normal q.....	66	26	8	72.7	27.3
Sugg. q.....	59	25	16	70.7	29.3

Thus Stern concludes that errorless testimony is not the rule but the exception; that the *Bericht* is far more trust-

worthy than the *Verhör;* that every question has a suggestive influence; etc.

Ranschburg (48), with thirty feeble-minded children of ages from eleven to seventeen; Rodenwaldt (50), with fifty soldiers of from nineteen to twenty-three years of age; and Revesz (49), with twenty-six morally depraved pupils ranging in age from nine to fifteen, made experiments after the same method and with the same picture Stern used; Oppenheim (45), with thirty girls of from ten to twelve years of age, in 1904, with three pictures named *Bauernstube, Feld,* and *Wasser,* after Stern's method, and Breukink (11), with 108 adult observers repeating the experiment of Oppenheim,—obtained similar results. In the experiments of Oppenheim questions and answers were given orally, while with Breukink they were in written form. The former experimenter, from the second test on, encouraged her observers to do better work, telling them that many false answers had been given. This, undoubtedly, warned the observers against the influence of the questions, especially against the suggestive ones, so that a better result was obtained in the later than in the earlier experiments. The educability of children in the giving of testimony is clearly observed in both cases.

Wreschner (70), dissatisfied with the method of Stern in regard to the *Bericht,* used his own method, the so-called examination-method (*Prüfungs-methode*). According to his explanation, its chief characteristic is that exactly specialised themes for testimony are given to the observers; it has the advantage of making conditions similar for all observers, and obtains an equal number of statements (*Angaben*) from all observers, so that the number of the statements, omissions and errors can be exactly calculable, etc. He notes that this method is closely connected with the *Verhör,* but he seems rather to ignore or at least to disregard its suggestive influence, as well as that of the usual interrogatory method. He used a picture called "*Grossvater*" with nine observers. A spontaneous report was given immediately after an observation of one minute; the second was given after seven days; and the so-called examination-method was used after seven days for four observers and also after seventeen days for the other five observers (70. p. 174). The results by this method also were similar (70. pp. 174-5).

Thus it is seen that the examination method like the *Verhör* raises many statements from latency into actuality, but, at the same time, it produces many errors, undoubtedly due to suggestive influence caused by narrowing the conscious field.

Borst (9 and 10) who followed partly Wreschner's method so that there were supposedly no suggestive questions in her experiments, though there were in reality such; Cohn and Gent (17), with and without distraction of attention during the observation of the pictures; and Dieffenbach (16) with ninety-eight observers of ages from seven to twenty, obtained results similar to those already given.

We now turn from the experimental results by the picture method to those of the objective method (*Wirklichkeits-methode*) and cite a few of the results. In the winter of 1903 and 1904 an experiment was made by Stern (61) on the students in his psychological seminary at the University. The procedure was as follows: A gentleman steps into the seminary, wishes to talk with the lecturer (Stern), hands the latter, with a few words, a package of manuscript, asks the latter's permission to make use of the library in the seminary-room, takes up a book, goes out after five minutes taking the book with him and is asked by the lecturer (Stern) to wait outside for the latter until the close of the seminary." The number of the observers were fifteen, six women teachers and nine students. After eight days the *Bericht* and *Verhör* took place in writing. The result (61. pp. 17-22) was: With the *Bericht* the true statements amounted to 75% and the false statements to 25%; with the *Verhör* 50.5% and 49.5% respectively.

So, too, in the summer of 1904, Lisst (36) with twenty-two students, and Rohde (51) in 1907 with neuropathological but mentally sound patients, arrived at conclusions similar to those of Stern.

Suggestibility has hitherto almost always been investigated by introducing suggestive questions among the normal questions and by a comparison between results obtained through the normal and suggestive questions. This method is not entirely trustworthy, since the suggestive questions may refer to different objects, and the different objects are not retained in memory with equal clearness. (35. pp. 418 ff.)

This criticism may be avoided, if one investigates the memory for one and the same object by differently formulated questions. But naturally these different questions can not be addressed to one and the same person, hence one must put them to different persons as follows: The questions about an object (1): to the person (A) in the form (a), namely without suggestion, to the person (B) in the form (b) or with simple suggestion, and to the (C) in the form (c) of strong suggestion. This way Binet (6. pp. 296 ff) proceeded. But it may be objected that different persons are asked different

questions. This objection can, however, be avoided, if one asks further questions about the object (II): to the person (A) in the form (b), to (B) in the form of (c) and to (C) in the form of (a); and further about the object (III): to (A) in the form of (c), to (B) in (a) and to (C) in the form (b).

With this in view, Lipmann and Wendriner (35. pp. 418 ff), in the year 1904, made an experiment on twelve children of ages from four to six, using the picture called the '*Bauernstube.*' The questions were of three kinds, namely, group (a) was without suggestion, group (b) of an expectant nature, and group (c) contained strong suggestion and was composed of hypothetical and incomplete disjunctive questions. Each child was asked three questions of each group. The results were with group (a), the right statements amounted to 94% and the false to 6%; with group (b) 75% and 25% respectively and with the group (c) they were 44% and 56% respectively. Because of the testimony by too small children, we can not draw any ultimate inference from such results, but still we can see a general relation among these different questions. Lipmann (33) later made an extensive experiment which gave the writer much valuable material which will be referred to later.

There are two more important investigations on questioning, one by Franken (22) in 1911 and the other by Bader in 1912. Franken considered the report not only as a product of the intellect, but also of will. With this in view, he tried to test the educability of the power to report in children, that is, whether children can be taught to be more careful in stating that they do or do not know this or that thing. His subjects were 150 pupils from eleven to thirteen years. He arranged 200 questions relating to data in history, geography, etc. into two series: one as decisive and the other as determining questions. The first 100 questions begin with the words: "Do you know" so as to be answered merely by "yes" or "no;" for example, "Do you know on what river Lyons is situated?" The second hundred questions are so formed that a specific answer is to be given directly, for instance, "On what river is Lyons situated?" Among other results he found that by this means the pupils can be made more cautious in their answering, though the false answers can not be fully eliminated. Some of the other results will be referred to later on.

Bader's experiment (3) was to investigate the influence of the question, on reaction-time, the quality and quantity of an

answer, etc. He used the following nine different forms of questions or rather stimulus words for reactions. (3. pp. 3-4.)

1. What is the activity of the person designated by the stimulus word? Stimulus word: "soldier"—answer: "Marching."

2. What idea stands in a customary relation with the number given as a stimulus word? Stimulus word: "Seven"—answer: "Week." And so on. His results are very interesting and agree with the writer's view formulated before reading his article.

To sum up, the chief points of the results obtained by all these experimenters in regard to testimony and questioning are:

1. The errorless report is more frequent in the *Bericht* than in the *Verhör,* though it is the exception and not the rule.

2. The false statements of the *Bericht* are from one-half to one-sixth of those of the *Verhör.*

3. The range of the *Verhör* is far greater than that of the *Bericht,* but at the same time it is accompanied by an increase of errors:

4. Hence the *Bericht* is far more trustworthy than the *Verhör.*

5. The report given in reply to normal questions is generally far more trustworthy than that to suggestive questions.

6. The ability to report is educable to a certain extent by practice, warning, or correlation.

It should, however, be noted that the results above enumerated are merely the average of greatly diversified individual reports, and hence show neither any standard nor any rule for individual ability.

The Writer's Experiments

As a result of their experiments, Binet, Stern and others concluded that a spontaneous report should be asked first and then an interrogatory be given as a supplement to the former, since if questions are asked without a *Bericht,* there is great danger of falsification of memory induced by the questions which may not be eliminated later on by any means. This is certainly true, but none of these authors have shown how far this is true.

1. They demanded the *Bericht* first and then the *Verhör,* and failed to find out what influence the *Bericht* has on what has been given in the *Verhör,* that is, what would be the result, if the *Verhör* were given first and the *Bericht* followed.

2. Their questions were on points not reported in the *Bericht,* that is, the questions were not on every point concerning the facts under consideration but only on the omitted ones. Although Miss Borst did this, she as well as others ignored or rather failed to find what influence the succeeding *Verhör* had upon what had been reported in the *Bericht.*

These two points are very important for the formulation of any rule in regard to the order or place of the *Bericht* and the *Verhör* in the report as a whole.

With these points in view, experiments were undertaken to determine whether or not the results obtained by the other investigators are applicable in any way to the subject matter in our school curricula.

Only the following points are considered in this paper.

1. What is the relation: (1) between the *Bericht* given first and the *Verhör* following; (2) between the *Verhör* first and the *Bericht* succeeding.

2. What is the relation between normal and suggestive questions?

3. What is the relation between questions suggesting the right answer and questions suggesting the wrong answer? Here by suggestive questions we mean the so-called expectant as well as the 'yes or no' questions.

Method of Experiment

As our interest is in practical application, we selected our materials from Frye's Grammar School Geography and Adam's Commercial Geography; the section on the Surface of South America and the section on the Guianas. (See appendix.) The experiments were carried out at two different times, one, at Dix Street School, in February and the other at Edgeworth Street School, in April, 1913, at Worcester, Mass. Both were partly conducted by the teachers of each class and partly by the writer personally, but always under the writer's guidance.

In the first experiment the number of pupils was ninety, twenty-one from grade 7-1, twenty-seven from 7-2, twenty-six from 8-1, and sixteen from 8-2; but three of grade 7-2 and one of grade 7-1 are not included in our numerical calculation, as they did not finish their work in time. In the second experiment, forty-four pupils took part: eleven from grade 7-1, ten from grade 7-2, thirteen from grade 8-1 and ten from grade 8-2. Both of 8-2 were given the section on the Guianas as subject-matter which they reviewed silently for ten minutes

before the *Bericht* and the *Verhör* were required; the rest of the pupils were given the section on the Surface of South America which they reviewed about six to seven minutes before the *Verhör* or the *Bericht* was required. The time for the *Bericht* was about fifteen minutes and that for the *Verhör* about twenty minutes. The pupils of both grade 7-1, and those of grades 7-2, 8-1, and 8-2 in the second experiment answered the *Verhör* first and then gave the *Bericht;* and those of 7-2, 8-1 and 8-2 of the first experiment gave the *Bericht* first and then replied to the *Verhör.* In the experiment when the *Verhör* was given first, care was taken to erase the questions entirely from the blackboard before the *Bericht* was demanded, and also to make clear to the pupils that they should report again all that they knew on the subject in the *Verhör.*

The suggestive questions were formulated according to Lipmann's advice, that is, different forms of the suggestive questions were asked on the same subject-matter but to the different observers so that the suggestiveness of the questions might be compared. The pupils of grade 8-1 in the second experiment were not asked suggestive questions but the normal questions. During the experiment every precaution was taken not to give any suggestion whatever.

Numerical Calculation of Data

The following device for estimating our data was adopted, after various methods had been tried, as giving the fairest treatment:

A. In regard to the data on the Guianas.

1. A complete answer to each question was credited as one point.

2. An answer that gave one datum where a question demanded two data was counted as half a unit.

3. Answers to some of the questions (such as 11, 12, and 14. See Appendix.) were not demanded in full. If a pupil gave two names of the products or goods for exportation or importation, he was credited one point, if he gave only one name, he was credited half a point.

These regulations were followed in estimating the data in the corresponding *Bericht.*

B. As to the data regarding the Surface of South America.

1. A fact involved in each question was counted as one unit.

2. In the corresponding *Bericht,* the same rule was applied, but here a few exceptions were made.

a. If a pupil reported: "The vast forests in the Amazon river basin are called Selvas," he was awarded two points, since this report contained two facts corresponding to two questions in the *Verhör;* but if a pupil reported: "The vast forests in South America are called Selvas," he received only one point, as it gave only one fact.

b. If a pupil reported: "The Andes highland lies along the west coast of South America, he was credited with two points, though this answer, strictly speaking, is not complete, since it is important to know that the Andes is the primary or greatest highland.

c. If a pupil stated: "There are three plains called pampas, llanos, and selvas," he was credited one point, since some pupils thought that selvas meant a grassy plain in the south, while pampas meant a forest in the Amazon basin, etc.

As a whole these were the only difficulties, and so few in number that any alteration in the crediting caused but a small fraction of change in the percentage. The question naturally arises: Does not the pupil make any statements in the *Bericht* in addition to those contained in the sections employed for the experiment? To my surprise only five such statements intruded into the spontaneous reports: two pupils added "Plata river;" another two "Orinoco river" and one "Guiana highland." These five points were credited, if the statement was clear.

Results

Our results are as a whole very similar to those obtained by the other investigators as the following tables show. That is, our results show that the *Verhör* gives far greater range of report in quantity, but much worse in quality than the *Bericht*. It is, however, to be noted here that while this is always true of the general average, it is by no means true of each individual. Five pupils made no errors in either the *Verhör* or the *Bericht*. Tabulating the reports of the normal questions, we have fourteen out of 130 pupils who obtained the full credit for every one of the questions. In both spontaneous reports it is rather surprising to find that ninety-five out of 130 pupils committed no errors.

RESULTS OF FIRST EXPERIMENT

	Grade 7–1					Grade 7–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Bericht.....	6.4	.14		97.7	2.3	5.8	.35		94.3	5.7
Verhör.....	18.3	4.1	1.6	81.6	18.4	18.3	4.2	1.5	81.3	18.7
Normal q...	12.4	2.4	1.2	83.8	16.2	12.5	2.3	1.2	84.4	15.6
Sugg. q....	5.9	1.76	.34	77.	23.	5.6	2.1	.3	72.7	27.3

	Grade 8–1					Grade 8–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Bericht.....	5.2	.35		93.7	6.3	5.8	.2		96.6	3.4
Verhör.....	17.9	5.	1.1	78.1	21.9	13.4	2.1	1.5	86.4	13.6
Normal q...	12.3	2.9	.8	81.	19.	8.5	1.1	1.4	88.5	11.5
Sugg. q....	5.6	2.15	.25	72.2	27.8	4.94	1.	.06	83.1	16.9

In the above table, with grade 7-1, and in the following table on the next page with all grades the *Verhör* was given first and then the *Bericht*, while with all the rest the *Bericht* was given first and the *Verhör* followed.

RESULTS OF SECOND EXPERIMENT

	Grade 7–1					Grade 7–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Verhör....	19.	4.1	.9	82.2	17.8	19.8	3.65	.55	84.4	15.6
Bericht....	7.7	.54		93.4	6.6	8.1	.6		93.1	6.9
Normal q..	13.18	2.36	.46	84.8	15.2	13.8	1.85	.35	88.1	11.9
Sugg. q....	6.2	1.5	.3	80.5	19.5	5.9	1.8	.3	76.6	23.4

	Grade 8–1					Grade 8–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Verhör....	18.3	4.1	1.6	81.7	18.3	13.05	3.1	1.85	80.8	19.2
Bericht....	6.	.4		93.7	6.3	5.1	.1		98.	2.
Normal q..						9.1	1.55	1.35	85.4	14.6
Sugg. q....						4.3	1.5	.2	74.1	25.9

I. *Relation between the Bericht given first and the succeeding Verhör.* A certain number of the statements given in the *Bericht* were altered rightly or wrongly in the succeeding *Verhör* as follows:

CORRECTIONS

Pupils	r to f	r to u	f to f	f to r	f to u
7–2 (7 pupils).....	7	3	3	2	
8–1 (11 pupils).....	16	4	3	4	
8–2 (6 pupils).....	3	6			2
Total.....	26	13	6	6	2

In other words, thirty-nine correct statements out of the total 402.5 given by the sixty-six pupils in their *Bericht* were changed wrongly in the succeeding *Verhör* by twenty-four

pupils. For instance, in the *Bericht,* two pupils reported that the Andes highland lies along the western coast of South America, but in the *Verhör* they answered question 7, "the Brazilian highland." Another boy and girl reported that the Amazon river flows from the Andes highland and is the largest in the world, but they answered question 15, "from the Brazilian highland." Some pupils reported in the Bericht, "the coast of South America is not as irregular as that of North America," but they answered question 3, b, with "yes, it is as irregular as that of North America." Two girls of grade 8-2 reported that the British and Dutch planters plant coffee and cocoa in place of the sugar-cane because the price of cane-sugar has declined, but they failed to answer question 5. On the other hand, six of the total 18.5 false statements in the *Bericht* remained false in the *Verhör;* the other six of the 18.5 false statements were corrected by the questions in the *Verhör;* while the other two were changed to the answers: "I don't know." Thus we may justly infer that the *Verhör* is more likely to make the right statements of the *Bericht* false than to change the wrong statements to right ones.

The question naturally arises here: Why should questions as a whole have such an influence even upon what was given correctly in the *Bericht?* The reason which we shall discuss later on may be stated here briefly as follows: The pupils are now questioned after they have given what they thought true and correct, and this inquiry draws their attention to the idea so intensely that it rouses in their minds an element of doubt and causes them to become more suggestible.

II. *Relation between the Verhör given first and the Bericht following.* To determine this has never been undertaken by any of the investigators. It becomes thus one of the chief points of interest in our experiments. We said as a result of the experiments hitherto performed that the questions influence our memory so much that any distortion right or wrong may not be eradicated later. From this it might be supposed that after a given lesson had been studied for a certain period of time, if questions be asked that cover each fact, one should be able to give a far better report in the succeeding *Bericht* on the same subject-matter than if asked to give a *Bericht* immediately after the study and before the detailed questions. Indeed the questions preceding the *Bericht* analyze the whole subject matter clearly into points and connect them with the questions so that they serve as a sort of resumé and may thus facilitate the succeeding *Bericht.* And to a certain extent this hypothesis is true, but not so completely as might naturally be expected. If we compare the results from grades 7-1 and 7-2

in the first experiment, which are most justly comparable, because the pupils were taught by the same teacher under the same conditions, we see only a slight difference; again the results from grade 8-1 in the second experiment, where no suggestive questions were used, and 8-1 in the first experiment, and from 8-2 in both experiments show merely slight betterment, although 7-1 and 7-2 of the second experiment show rather better work than any other.

Furthermore, the *Bericht* that followed the *Verhör* revealed a most interesting phenomenon: nine correct statements out of the total 478 given in the *Bericht* by the pupils of grades 7-1, 7-2, 8-1 and 8-2, were not answered by them, when questioned in the preceding *Verhör;* forty-five correct statements of the 478 were the correction of what was stated falsely in the previous *Verhör;* sixteen false statements of the 478 were the remainders of what was already given falsely in the *Verhör;* and three false statements of the 478 were the falsification of what was given rightly in the *Verhör.* For example: one girl answered, "no, it does not," to question 16, b, but in the succeeding *Bericht* she said that the surface of South America resembles that of North America. One boy answered the question 22 (what are the vast forests in Brazil called? Answer, selvas), with "They are called pampas," but in the following *Bericht* said: "The vast forests of Brazil in the Amazon basin are called Selvas."

These facts show clearly: that the influence of the *Verhör* upon the succeeding *Bericht* is rather slight, that the mental activity of the children in the *Bericht* differs from that in the *Verhör* where they are made abnormal and passive, being compelled by the external influence of the questions, while in the *Bericht* they are self-dependent, being free from any external compulsion; or in other words, we may say that the mental attitude of the pupils towards the *Verhör* is different from that towards the *Bericht.*

In regard to the so-called sequence or place of the *Bericht* and the *Verhör,* we are made a little skeptical about the statement that the *Verhör* should be subordinate to the *Bericht* as a sort of supplement. It is certainly better to ask the *Bericht* first and then give the *Verhör* on those points not stated in the *Bericht* so that any distortion of what was given in the *Bericht* may be avoided in the *Verhör;* but if our inference is correct, that is, if mental activity in the *Bericht* has a peculiar tendency to correct what was given falsely in the *Verhör,* then is it not also useful to demand a second *Bericht* after the *Verhör?* In school practice, and even in the court where we do not know

anything about the event, we may ask questions first and then demand the *Bericht* just as well as to give the *Bericht* first and then the *Verhör,* so long as there is no hypothetical, incomplete disjunctive and sequential question in the series of the given questions. The writer does not disregard the suggestive influence of questions by any means, but wishes to emphasize the significance of the mental attitude in the *Bericht.*

In order to avoid repetition, the rest of our results will be given in connection with the discussion of the other aspects of our problem.

Difference of Psychic Activities in the Bericht and the Verhör

Why is the *Bericht* always more trustworthy than the *Verhör?* Why is the range of the *Bericht* always far smaller than that of the *Verhör?*

The psychic after-effects of the impressions received in the observation are of various degrees of intensity, vividness and clearness. The things observed with interest and attention are apt to be most firmly fixed and thus be kept most clear, while those perceived inattentively or unconsciously leave behind only insignificant traces or none at all. (58. p. 329.) Intense, vivid and clear images or ideas lie always nearest to the threshold of consciousness waiting, so to speak, for the imperative impulse for self-expression to shake off the yoke of inhibition. Such ideas take precedence in the *Bericht.* In addition to these, the observers with more or less effort raise above the threshold many ideas of somewhat vague potentiality which have lost their clearness and obtrusive character in comparison with those of the first group, although still possessing sufficient persistence to come within the sphere of voluntary recollection (58). Hence the *Bericht* is not passive, but active in the highest degree. It is a more or less powerful and independent conscious selection of the most vivid and clear ideas in memory to which is attached the feeling of the greatest certainty and, above all, of spontaneity. Because of this will-activity with a feeling of spontaneity, any vague ambiguous and uncertain ideas are rejected. Consequently the *Bericht* is good in quality though unfortunately its range is small. This psychic activity in the *Bericht* can be further verified by the results of experimentation. Rodenwaldt gave his observers an opportunity to look at the picture again in order that their self-correction might be made in both the *Bericht* and the *Verhör.* This showed that the correction of the *Bericht* was so small, as to amount only to one-seventh

of the total false statements in the *Bericht*, while two-fifths of the false statements in the *Verhör* were corrected. This clearly shows that the confidence in the *Bericht* was so great that there was no thought of correction. (58. pp. 325-326.)

It is quite different with the *Verhör*. The activity here is passive or reactive in a sense of being constrained from without,—though it is quite necessary and helpful for recall of what the spontaneous report fails to give. The effect of a question or theme for recollection is twofold (24): it offers a key to open the store-house of the latent ideas which otherwise may remain continuously submerged, or it may draw the observer's attention to a gap in his knowledge so that he attempts to fill it with an answer of some sort. And this is done quite often from an irresistible impulse, since every question, even the most indifferent, the most cautious and the most unsuggestive, as appears in the experiments, is more than a mere question. It is a command for a recollection and the production of a certain answer (58. p. 330). This double effect of a question in suggesting to an observer a true or false answer is clearly seen in all the results mentioned. So great is the wish to give a certain answer, that the critical power is weakened. Hence the increase in quantity and the deterioration in quality in the report. The psychological conditions of the false answers are very different and depend on many factors which will be discussed later.

Obviously there are disadvantages in both the *Bericht* and the *Verhör*. Testing the mental state of a child by either would be a defective method. As Stern (58) and Wreschner (70) state, the spontaneous report allows very great latitude in individual voluntary activity and this causes some observers to notice very few, and others very many details, thus making the comparison of the different observers a particularly difficult problem. Moreover, we can not state justly whether a failure in regard to a certain fact or point in the *Bericht* is due to a lack of retention or failure in the power of immediate recall. Hence neither the *Bericht* nor the *Verhör* taken separately give the real mental status of the observer. They must go hand in hand. We must remember what we have already shown that to neglect to train the power in the *Bericht*, and to rely on the *Verhör* alone is to make children passive and halting in their self-expression and independent mental activity.

The following examples taken from the answers given by our observers show the great individual variations among pupils. Some can do good work respectively in both the

Bericht and the *Verhör,* while most of the observers fail in the *Bericht,* not only when given before but also after the *Verhör,* in spite of the fact that they can do fairly good work in the *Verhör.* One boy who could answer in the following *Verhör* twenty-three questions correctly out of twenty-four, gave his *Bericht:*

"South America is mountainous in the northern, eastern and southern part it is lowlands in the central part and hilly in the western part. (12-year-old.)"

A fifteen-year-old boy gave this *Bericht,* but answered nineteen out of twenty-four questions in the *Verhör* following.

"South America has a narrow surface center a level plain on the north and south and a mountain highland on the east and west with an irregular coastline."

On the other hand, a fifteen-year-old boy answered only eight out of seventeen questions, though he had given the following excellent *Bericht.*

"The three Guianas (British, Dutch and French) are interested in the production of cane-sugar and its by-products, molasses and rum. Owing to the decline in the price of sugar-cane, the British planters have replaced it by coffee and cocoa. The British supply one half of the fuel and coal used, and the United States one fourth. A large amount of rubber is produced in the Guianas, and an important amount of gold. Most of the cultivation is done on a narrow strip of land near the coast, where most of the people live. Paramimbo is the important trade center at Dutch Guiana, and trade of French Guiana."

A thirteen-year-old girl had answered correctly twenty out of twenty-four questions, but gave a poor *Bericht* after the *Verhör,* viz.

"South America is very mountanous, it has a higher highland on the west and a lesser highland on the east and a great plain between."

A twelve-year-old boy had answered only fourteen out of twenty-four questions, but gave a fine *Bericht* after the *Verhör,* viz.

"South America resembles North America in shape, etc. The northern part is wide but tapers towards the south. There are great mountains on the west and smaller highland on the east. The Andes highland on the west is long and narrow; and higher than the rocky mountains of North America. The highland of Brazil on the eastern part is wide but not nearly as high as the Andes. There is a great plain between these two highlands called the central part. It is divided into three sections. The central part along the Amazon river is called selvas meaning forests. The northern part is called llanos meaning grassy plains, the southern part called pampas also means grassy plains."

The Nature of the Answer Depends on the Form of the Question

There are various forms of suggestive questions, though not always perceived as such. Stern says that hardly any ideal question is an entirely unsuggestive question. (58. p. 339.) Hence it is impossible to avoid suggestion in the *Verhör*. (64.) Against the above statement of Stern, Miss Borst (9. p. 78) argues as follows: "I can not agree with him. According to my opinion, there is suggestion only when we put to an observer a question which refers itself to an object which was not present in the picture or the like employed for the experiment, and by means of which a false idea will be smuggled into the observer's mind. All other questions, however, which refer themselves to a really presented thing, build only a support for recollection, and that is exactly what is aimed at by the *Verhör*." (9. p. 78.) Thus she means by a suggestive question one which gives a false suggestion, but, as we shall see later, we know that a question may suggest a right answer. Moreover, what does her phrase "a support for recollection" mean? Does it not mean a narrowing or limitation of our conscious activity, leading or inducing the observer to focus his attention on a certain idea or ideas? When the mind of the observer becomes more and more a blank as the result of voluntary inhibition of ideas or associations, he is more apt to yield to suggestion. This is because the power of suggestion often consists in the fact that the mind is centered on only one or two ideas; all distractions are carefully excluded, and much greater power is therefore manifested along the restricted line than when the mind is attending to many stimuli simultaneously or in rapid succession. Inhibition of all ideas but one greatly intensifies the one.

Along this special train of thought we are prone to be swept by suggestion. Does there not then in the function of support for recollection lie a suggestive influence which she seems to ignore? It is a matter of course that every question is not suggestion, but there is suggestion in every question. She further says: "One observer, for instance, forgot to name an apron in his enumeration of the articles of clothing, and I put to him the question, whether the child had on an apron or not? Here we have certainly nothing to do with a suggestive question, for there is no ground at all which to the observer would suggest a positive answer rather than a negative one." (9. p. 78.) But if the observer failed to notice the apron, as Breukink (11) found, he might get a suggestion from such a question. We can not, however, agree with Stern (64) when he says that it is absurd

to ask, for instance, about the color of a hat, when the observer has not named it in his enumeration of articles of clothing. He maintains that by this question suggestion will be made; for when the observer omits the naming of the hat, it shows that he had no recollection of its existence. Miss Borst remarks, I do not understand this objection: "The investigations of memory teach us (and Stern himself has emphasized this) that it can not be said that a recollection has vanished from the memory. Even when it does not occur spontaneously; elements of recollection can remain latent in memory. The purpose of the *Verhör* is precisely to revive these elements of recollection from their latency." (9. p. 79.) All the other investigations as well as our own have shown that the observers have failed to mention certain things, yet answer questions in regard to them with certainty. It is a question whether or not such an answer is suggested or a real memory. Probably both factors co-operate in such a case. A question as a whole has not a suggestive influence when the memory is clear, vivid and strong, and accompanied by a feeling of certainty. On the contrary, every question is apt to be suggestive when the memory is vague, obscure and uncertain.

The suggestiveness of the questions may be graded artificially according to the logically-grammatical form of the questions.

Attention was drawn to this problem first by Binet (6. pp. 297 ff), but the more elaborate gradation was left to Stern (58. pp. 338-345) and later taken up by Lipmann. Stern grades the suggestiveness of the questions beginning with the least suggestive as follows: (1) The determining question (*Bestimmungsfrage*), or the question introduced with interrogative-pronoun or adverb: which, who, where, why, etc; (2) the complete disjunctive question or the "yes or no" question; (3) the incomplete disjunctive question or the "either-or" question; (4) the expectant (leading) question or the "yes" question or "no" question; (5) the hypothetical and (6) the sequential question (*Folgefrage*). Lipmann (33. pp. 58-60) used practically the same distinctions. Each of these forms of the questions has its own peculiar psychological significance or function. We shall follow the analysis of Stern.

The determining question offers a wide field of ideas within which an observer can exercise his own power of free choice. Hence he can be self-assertive in his answer; for instance: what is A? Describe B? has no limitation for the field of ideation about A or B. Such a question simply appeals to the

memory without suggestion. Thus it is considered as the most indifferent and harmless question.

The complete disjunctive question, or the "yes or no" question, requires the observer to decide between the two ideas offered by the question, or between 'yes' and 'no,' one of which is always false. For example: Was that A or not? Here the idea A is presented to be selected or negated from the vast field of other ideas, and apparently there is no limitation for the answer. But when we introspect, we perceive the idea A clearly and distinctly with vague ideas coming and going in our conscious field, as its back-ground. Consequently the idea A has an affirmative, while the rest have a negative tone. The only chance is either to affirm or negate A. This limitation in the selection of the answer renders the suggestion more influential than the preceding question.

According to both Stern and Lipmann, the tendency to answer "yes" is stronger than that to answer "no," but Borst takes an opposite view. This may be due either to the special influence of her oral questioning or to difference of suggestibility of the observers, as it is found by Goddard (23. p. 4) that a certain type of child will always answer the last of two alternatives. Our experiment also shows that a certain child answers always with "yes," and another always with "no," no matter whether the question is a "yes or no" question or expectant question, but the tendency to answer "yes" is far stronger.

Lipmann says (33. p. 58) that the complete disjunctive question, for instance: It is A or B? is less suggestive than the "yes or no" question, *e. g.*, Is it A? This is to be contrary to the result of writer's own introspection. The form, "Is it A or B?" suggests dual or rival determination, presupposing belief in a sphere of existence in which either supposition or both may have confirmation according to the meaning. Though there is surely suspense as to which of the possible assertions is to be accepted, but the certainty of the issue to be A or B or both is expressed, and consequently the field of ideation is exhausted by A and B (15. p. 347). On the other hand, "yes or no" question, *e. g.*, "Is it A or not?" or "Is it A?" are of an indefinite alternative over against the definite alternation of the complete disjunctive question, because "it may be A," or it may be something else. Of course it may happen to be exclusive, if "it is A," but never exhaustive in its suggestive influence like the complete disjunctive question proper.

There are two kinds of "yes or no" question which are ignored by the great majority of questioners. A question,

"Is it A?" is called a true "yes or no" question, when the answer A is true; and it is called a false "yes or no" question, if the answer A is false. The following table shows the difference of suggestiveness of each form of question for 117 pupils in our experiments.

	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
True yes-no-q.....	174	25	11	87.4	12.6
False yes-no-q.....	119	85	8	58.3	41.7

Hence it appears that the true "yes or no" question produces far more right answers in every case than the false one, while the latter without exception produces more false answers than the former. Moreover seven of 117 pupils answered with "yes, so and so," and three with "no, so and so" to every "yes or no" question whether or not its content was true or false. From these results it appears that our school children are not only suggestible but also are mechanized to react to the form of the question instead of to its content.

The expectant question (leading question), is more suggestive than the former according to Stern and Lipmann, since the form of the question in itself represents the questioner's expectation and leads the observer to accept it unconsciously. Take, for example, a question: "Was it not A?" and analyze it into the two parts: "It was A" and "was it not?" The first part affirms that it was A, while the second shows a clearly expressed expectation. The mind has a tendency to accept as true anything that enters it. A belief is urged from the start by the words "was not." The suggested idea must, thus, dominate, even when the observer has a clear knowledge of it, as the possibility of doubt is covered by the probability of the expectation. The first given interpretation persists and is taken as true even without being consciously regarded as true or false. This is frequently true when his knowledge is vague, and his belief in the questioner is strong. The expectant question is, according to Lipmann and also in the opinion of the writer, weaker than the incomplete disjunctive question, for the former causes the observer to appeal to his memory, feeling of course the influence of the insinuation which results from the question, and in some cases the word 'not' serves as a warning, while it is not the same with the incomplete disjunctive question which offers two ideas, neither of which is true, presupposing that one of them is true.

Lipmann differentiates the expectant question as false and true according to its meaning. For example: Is it not A? is true if asked, when the answer A is right, and it is false, when the answer A is false. His result shows (33. pp. 69-70): "the false answers were diminished about 24% by the right expectant questions, and the right answers were diminished about 18% by the false expectant question in relation to the total statements. The right answers were increased about 12% by the true expectant question and the false answers about 2% by the false one, in relation to the total statements. In both cases the suggestive formulation caused an increase of the uncertain answers; with the true expectant question about 13%, and with the false about 17%. Thus he concludes that the true expectant question has a stronger influence than the false, and that the former brings out more right and fewer false answers than the latter. (33. pp. 54, 60, 61.)

Our experiments with 117 pupils confirm Lipmann's results. The expectant questions gave: r = 137, f = 27, u = 1, that is, the true statements amounted to 83.7% and the false ones to 16.3%, while with the false expectant questions, r = 98, f = 55, u = 8, that is, 64% and 36% for r and f respectively. Furthermore twelve of 117 pupils in both experiments answered every expectant question, whether true or false, with "yes, it is so," and three with "no, so and so." Here again, the children are habituated to react to the form of questions, and not to their content. It is of a vital significance for a teacher to recognize this different function of the true and false questions, as each gives such a different result clearly shown by our table.

The incomplete disjunctive question is stronger in its suggestive influence than the preceding ones, since here neither of the answers can be right. As, in case of the complete disjunctive question, the possibility of an answer is not only logically exhausted, but the probability of a wrong answer is very great; for to answer independently of the two alternatives offered requires a mental self-reliance, of which most of us are not capable. This type of the question too can be divided into two forms: true and false, according to its content.

The hypothetical question is in its form exactly the same as that of the determining question, for instance: "what is the color of A?," and must be valuated unsuggestive from the stand-point of the form. But suppose that the observer until questioned did not know of the existence of A, what will be suggested? He will surely reason: The question asks now after the color of A, then there must have been A (58.

pp. 342-343). He will thus come to silently accept the intentional suggestion of the questioner. If A is once accepted, it is easy to attach attributes to it. Even when the observer does not or can not attach a color to A, if, for instance, he answers, "I do not know its color," he is still a victim of the suggestion, for he tacitly admits the existence of A in the form of his reply. The hypothetical question also can be divided into true and false forms according to its content. (33. p. 59.)

The sequential question makes use of an implication: One who says A, must also say B. (58. p. 343.) For instance: If a question, "was not A there?" (when in reality it was not there) is accepted by the observer, then this acceptance means that he will admit the existence of the color, size, etc., of the A, as it is natural to infer that the A should have been colored, etc. The sequential question is used when a hypothetical or the like question is accepted.

Thus we can make a graded series according to the degree of suggestiveness contained in the form and to some extent the content of the questions. However, the suggestive influence of each form of the above questions is not in its numerical percentage proportional to the scale. To answer a hypothetical and sequential question, a part or the whole of an object or a thing must be invented, and this invention needs a great mental effort, or a struggle against the present mental state. This is probably the reason why these questions result often in a small percentage of errors. Again that the effectiveness of the suggestive questions declines strongly with increasing age, while the frequency of the erroneous answers to the normal questions is fairly independent of age, shows that the nearer a question is to the normal, the less suggestive it is.

It is interesting to note that the observer passes through various stages of mental resistance against the suggestive influence of questions. According to Binet's observation, the first instance which follows the reading of the question is a moment of scepticism. This is shown by a murmur, "But I don't know," or by the gestures of ennui or negation, or mimic expressions, etc. Some translate this state of scepticism by the written answer, "no," which they finally efface; some say "no, it was not so." This state of an initial resistance persists indefinitely with some observers. (6. p. 303.) The second phase is that of half yielding to the suggestion. The observer commences to write his answer, but he is arrested by a decisive word or words. Finally, a third phase is that of the execution of the suggestion. Here the observer shows often,

at the moment when he writes his answer, a flushing of the face, as if he had a sentiment of shame. On the other hand, there is sometimes a resistance which is first at a maximum and then terminates with a disbelief in suggestion. (6. p. 304.)

The same phenomena have been observed very distinctly by the writer in his own experiments. It is rather surprising to find that thirty-two cases of 117 pupils in both experiments erased their answers to the "yes or no" questions as well as to the expectant questions and corrected rightly or wrongly in the following ratio, that is, twenty-two cases rightly, and ten wrongly.

For example, some pupils answered, "Yes, it is as irregular as that of North America" to the question 3 (b) (Is the coast of South America as irregular as that of North America?), but erased this answer and wrote "No, it is not." Others wrote first, "Yes, it means level land," to the question 21 (b) (Does 'llanos' mean level land?), but corrected it to "no, it means highland," erasing the first answer. Besides these thirty-two cases of correction, there were four special cases where two pupils wrote "no" as an answer, but erased it, and then wrote "no" again, while the two others did the same with "yes."

A comparison of the suggestive influence of each form of the questions by means of the experimental results already obtained follows.

That the "yes or no" question is more suggestive than the determining question has been shown experimentally by Binet (6. p. 313), Chomjakov (14), Lipmann (33) and others. Our investigation with 13 pupils showed with the normal questions (3, 9, 16, 19, and 24 of 2nd series, appendix), true answers amounted to 71.9%; false ones to 21.9%, and uncertain ones to 6.2%; with the corresponding true "yes or no" questions with 42 pupils, 90.4%, 9.6% and zero % respectively; and with the corresponding false "yes or no" questions, 54.7%, 41.5%, and 3.8% respectively.

The results of Stern, Rodenwaldt, Oppenheim, and others show that the leading (expectant) is more suggestive than the determining question. But in all these cases, the leading as well as the normal questions were applied to the different objects, so that we may not be justified in depending upon their results. The results of Chomjakov and Lipmann can justly be relied upon, for they applied both kind of questions to the same objects, though as a matter of course using them on the different observers. Chomjakov (14) showed three groups of each fifty students a sheet of paper which was

spotted with red and violet color. The first group was asked: "How many red and how many violet spots have you noticed?" The second was asked: "Have you not noticed red spots between the numerous violet ones here and there, and how many were there?" The third: "Have you not noticed between the numerous red spots here and there, also violet spots, and how many?" The results were: The first group answered on an average with eleven red and eight violet; the second with fifteen violet and four red; the third with four violet and fifteen red.

Our results agree to some extent with Lipmann's (33. pp. 53-4, 68-9). They show clearly that the true leading questions suggest the right answers more strongly than the false leading questions do the false answers when compared with the nonsuggestive questions corresponding to both.

We obtained in the experiments with the normal questions (8.13 and 21 of 2nd series, appendix) with 13 pupils: true answers = 71.8%, false = 20.5%, and uncertain = 7.7%; with the corresponding true expectant questions on the 42 pupils, r = 94%, f = 6%, and zero for u; with the corresponding false expectant questions, 66.7%, 20% and 13.3% respectively.

From all these experimental results, it is seen that the expectation aroused by means of the phrase, "Was it not," or words like "numerous," "truly," "perhaps," "honestly," etc., or some special instruction or silent manipulation—as in the experiments of Lobsien (38), Kosog (29, 30), Seashore (56. pp. 30-31), Scott (55), Plecher (47), and others,—produces a high percentage of suggestibility. And that the false leading questions do not act more suggestively than the false "yes-or-no" questions, provided that the former are differentiated from the latter only by the word "not," is determined by both Lipmann (33. p. 70) and Rodenwaldt (50). In our own experiments the false "yes-or-no" questions brought out more false answers than the false leading ones. This is perhaps due to the fact, as Rodenwaldt rightly states, that "the intelligent observers easily discover that they will be led into a trap by the word 'not'" and become cautious, while they more easily fall into a trap with the false "yes-or-no" questions where the word 'not' is omitted.

For the suggestive influence of the false hypothetical and the incomplete disjunctive questions the readers are referred to Lipmann's exact work (33. pp. 75 ff), Binet (6), Lobsien (38), and others.

In summarising, it may be said that the suggestiveness of a question to a great extent depends upon its form and its

content; that a determining question is the least suggestive; that the true leading as well as the true "yes-or-no" questions are more suggestive than the false ones, the former evoking more right answers and the latter more false ones without exception.

Relation Between the Suggestiveness of a Question and a Questioner

It makes a great difference whether a question is presented to a pupil by his fellow-student or by a teacher; to a witness, by a disinterested person or by a judge. "The presence of persons," says McDougall (40. pp. 98 ff), "whom we regard as our inferiors in the particular situation of the moment evokes the impulse of self-assertion; towards such persons we are but little or not at all suggestible. But, in the presence of persons who make upon us an impression of power or of superiority of any kind, the impulse of submission is brought into play, and we are thrown into a submissive, receptive attitude towards them." "The personality or impressive character," says Keatinge (26. ch. 5), "can set up in another a state of emotion sufficient to produce an unstable and easily dissociated condition of mind, and thus to inhibit the rise of the development of contrariant systems." Such an authoritative influence is apt to modify the nature of an answer.

Thus under the influence of an authority or of masterfulness in the questioner, an observer may come to such a logical conclusion as follows: "Why, what else can I think of? The desired answer must surely be right! The questioner should know it; why, I thought it was this, but he asks about that, am I then mistaken, or is he? No, he should not be so, then I must be." Consequently, if a question is a "yes-question" or a "no-question," he will answer "yes" or "no" without further reflection. If a question is a "yes or no" question, he will react to it with "yes," irrespective of the content of the question, even where according to his knowledge, the answer should be negative. Some pupils, as we have seen, are mechanized to answer "no" to every "yes or no" question, whether its content is true or false, while the majority are habituated to "yes." If, however, a question is an incomplete disjunctive or a false hypothetical question, one will decide in favor of the most probable answer (33. p. 214).

Next to authority, the facial expression of a questioner has a great influence not only for provoking or inhibiting an

answer, but also for determining its nature. The following examples are illustrative (68. pp. 84-85):

Counsel (taking up the two lower bones of the leg attached and approaching the witness.) "Will you please take these, doctor, and tell the jury whether in life they constituted the bones of a woman's leg or a man's leg?"

Doctor. "It is difficult to tell, sir."

Counsel. "What, can't you tell the skeleton of a woman's leg from a man's, doctor?"

Doctor. "Oh, yes, I should say it was a woman's leg."

Counsel (smiling and looking pleased). "So in your opinion, doctor, this was a woman's leg?" (It was a woman's leg.)

Doctor (observing counsel's face and thinking he had made a mistake). "Oh, I beg your pardon, it is a man's leg, of course. I had not examined it carefully.'

Counsel (still smiling). "Would you be good enough to tell the jury if it is the right leg or the left leg?"

Doctor (quietly and hesitatingly). "This is the right leg."

Counsel (astonished). "*What* do you say, doctor?"

Doctor (much confused). "Pardon me, it is the *left* leg."

Here it is clear that this doctor's answer was modified wrongly by the counsel's facial expression, which was interpreted by him as a sign that his answer was wrong. So, too, children's answers in the school-room are often modified by their teacher's facial expression. We cite a few examples from the returns to a questionnaire used not for the purpose of studying questioning but for the study of imitation and suggestion.

"The teacher in history may ask you a question and generally one that has to be explained. It might take three or four minutes to answer. All the time her face seems to be a perfect blank. She does not look at the person reciting or answering but directs her gaze in another direction. Sometimes I stop and wonder if I am saying the correct thing and then finish the recitation or answer in its midst. If she would only attend to our answers and recitation, we would have much more confidence in our work and do it better."

The slightest inclination of the head, the dropping of the eyelids, or a certain expression of the face are apt to be read by the shrewd pupil as a sign of the truth or error of his answer, so that he may continue or stop his recitation. (4. pp. 76-77.) It is better not to give any sign whatever while a pupil is answering, except for an encouragement when a pupil is timid or hesitates to express himself.

To help a child by such signs makes him passive, leads him to depend upon the teacher instead of relying upon his own knowledge. It fosters guessing or leads a bright but unprepared pupil to steer through a recitation guided by the

unsuspecting teacher. This will be more clearly understood through the following examples:

"I know," says a Normal School girl, "some teachers who ask a question in such a manner and tone that it is easy to know whether the correct answer is 'yes' or 'no.' Then I have known of another case where by the teacher's facial expressions, gestures, etc., you could tell, if you had only recited the first part of the answer, that it was wrong or right." (Twenty-one cases.)

Another girl says: "I have always been greatly aided in my recitations by carefully watching a teacher's face. In most instances I can tell whether or not I am 'on the right track.' There is something about their facial expression (very slight indeed) that helps me to 'feel my way,' so to speak. This means, of course, was used more during my grammar and high school years."

As the facial expression, so the tone of a teacher's voice affects the answers of children. In our school rooms we frequently notice that the pupils often decline or fail to answer the questions asked, and generally it is inferred that they do not know. But such an interpretation is very often incorrect. For instance, a girl of twelve says: "I knew very well the answer, but the teacher's tone of questioning suggested to me that she does not care much about the answer. So I felt that my answer was not important and consequently I did not answer." (9 cases.)

Two girls of the seventh grade say: "If a teacher shows that it is fun for her to ask a question, we become stubborn and simply refuse to answer."

Still another girl says: "If her tone indicates that she is cross, I don't feel free to talk during her lesson or to answer her questions; it also discourages me and makes me not to enjoy the subject. As a result I often remain silent waiting impatiently for the period to end."

"Our teacher's voice was so sharp and cross that whenever she called my name, I became very nervous and could not answer her questions even when I knew them well." (Thirty-one cases.)

On the other hand, a teacher who teaches out of the fulness of her heart will stimulate more responses in the children's minds and hearts.

Again when a questioner puts a special emphasis on a certain word or uses either rising or falling inflection in her questioning, the corresponding answer may be of little value. An observer takes a suggestion from the word that seemed most emphasized and reacts to it with the very word. Such a reaction is most likely to take place when a "yes or no" question or a "leading question" is asked with a certain inflection of tone.

Closely related to the above factors is a questioner's expectant attitude towards an observer. "As well known," says Krebs, "if everybody, especially those to whom we look

up expect us to fail, it requires the puissance of a psychological giant to withstand this killing psychic atmosphere. . . . If, however, they expect us to do our best, that very cooperative expectation inspires and infires us to do it, and we succeed." (31. pp. 53-54.) So, too, the expectation of a teacher causes the weak-minded, the discouraged, the nervous, and the like to form the same opinion of themselves. Thought tends to realize itself in actuality; they become what they think. This is why some children are made nervous or confused and often fail to answer a question or to recite, when asked with words like these: "John, can you answer, I don't think you can, but try it; Mary, I doubt if you can. . . . and so on."

A seventeen-year-old girl reports: "In another class I am almost afraid to say anything, because the teacher impresses me as having the attitude that she is sure I am going to make a mistake, and that she is very much surprised if my statement is correct. In one or two instances, I have known this teacher to stop a pupil in the midst of a statement, saying that it was wrong; while if she had let the pupil finish it would have been correct." (Five cases.)

Another factor that has an important effect on the nature and the possibility of an answer is a sympathetic or nonsympathetic attitude. Sympathy is an indispensable quality for normal suggestibility. As in water, face answereth face, so in man, the heart to heart. The following examples are illustrative:

"The plaintiff, a laboring man, had been thrown to the street pavement from the platform of a car . . ., and had dislocated his shoulder. He had testified . . . that . . . he had not been able to follow his usual employment for the reason that he could not raise his arm above a point parallel with his shoulder. Upon cross-examination the attorney for the railroad asked the witness a few sympathetic questions about his sufferings, and upon getting on a friendly basis with him asked him 'to be good enough to show the jury the extreme limit to which he could raise his arm since the accident.' The plaintiff slowly and with considerable difficulty raised his arm to the parallel of his shoulder. 'Now, using the same arm, show the jury how high you could get it up before the accident,' quietly continued the attorney; whereupon the witness extended his arm to its full height above his head, amid peals of laughter from the court and jury." (68. pp. 47-48.)

Such a drama is played by our school children more or less in response to a teacher's sympathy towards them. The effect of any unsympathetic attitude appears in various ways as follows:

A girl says: "One teacher I had was never sympathetic toward me. She was always finding fault with my recitation and answer unless I recited the lesson in her words. Thus I failed to answer even the easiest question." (Eight cases.)

Another girl says: "A fault-finding attitude of our teacher amuses me so much that I look indifferent and hit less in my answering in order to excite her." (Three cases.)

Relation Between Questions and the Person Questioned

All experimental results show that a suggestive question succeeds in one case, but fails in another. It never succeeds uniformly. Again some persons are so suggestible that they are influenced, even by nonsuggestive questions (57. p. 132); others can resist even the strongest suggestion involved in a question. The suggestiveness of a question thus depends primarily upon the suggestibility of the person questioned, and this is not constant, being dependent on many internal as well as external factors.

First of all, the mental content of the person questioned is responsible for the suggestiveness of a question. The potential starting point of an individual reaction is an object or a fact, ideal or perceptual; and every object, or idea, possesses for an individual mind a stimulative or a suggestive influence. The individual conscious state at the moment interprets a stimulus, accepting or rejecting it. Hence, if the content of the mind in question is poor, ill organized and unsystematized, the mind is apt to be a victim of an external as well as an internal stimulus. This is the reason why many experimenters hold that the less intelligent an observer is, the more suggestible he is, and that children are, in general, more suggestible than adults. Even with people of higher intelligence, deficiency of knowledge relating to the given topic heightens the suggestibility of the person questioned.

In the case of a child, a similar suggestibility occurs whenever there is little or no direct conflict with his experience. A child believes in any commanding idea, in a pleasurable or wished-for thing as well as a dreadful or not-wished-for thing. This subjectively conditioned belief, auto-suggestion or credulity supposes always a grade of dissociation, from which no child can be absolutely free. If this dissociation increases, the object of each agreeable idea can be finally believed and appears as real. (37. p. 246.) Belief is an original and a natural process in the mind of a child. He does not doubt any thing that he learns until he has accummulated a considerable amount of knowledge, and attained a relatively high stage in the development of intelligence. Moreover "to doubt is usually unpleasant and may arouse complicated strain sensations to add a new element to the unpleasantness" (46. p. 34).

Consequently, even when a child's knowledge is comparatively accurate, when he is under the sway of an authoritative impression or his own auto-suggestion, he may answer as suggested, thinking that perhaps that is called 'A,' which

used to be called 'B.' Such a reaction may not take place so easily if a question is asked by a fellow-student or an inferior person, but it is apt to happen under the influence of authority. When a person is influenced by a suggestion he loses his critical or analytical power towards the form and content of a question and simply attends to or searches in his memory for corresponding ideas, and finally produces his answer as if it was a spontaneous report. Whenever credulity and authority go together, the result is doubtful. Lack of will, too great credulity, and too little self-criticism are great obstacles to independent, self-assertive reaction (62. p. 272).

Another group of persons yield to a suggestion even against their own knowledge, because of their affection or because ambition is aroused towards a questioner. An observer really knows that to answer 'A' or not to answer at all is contradictory to his own knowledge, but he does not venture to resist the question asked; for he does not like to make himself disliked, or he fears punishment or some kind of annoyance. (33. p. 216.) Thus under certain circumstances, some observers conclude not to contradict directly, but also not to come in conflict with their own knowledge, and hence take an attitude of a compromise. (33. p. 231.) These affective reactions perhaps decrease with growing mental development and education. If this affection becomes stronger the suggestibility of an observer in general increases. "Whatever weakens the reason," says Cooley, "and thus destroys the breadth and symmetry of consciousness, produces some form of suggestibility. . . ." (18. p. 40.) So, too, Bleuler says that the suggestibility grows proportionately with the strength of an existent affection (7. p. 54), so that we find memory illusions even in the normal individual as soon as affection comes into play (7. p. 69). He continues: "Both suggestibility and affection render criticism difficult or check it even completely." (7. p. 69.) If an observer comes under such an influence, he becomes the unresisting instrument of a questioner. (58. p. 333.) He gives an answer to a question, but does not examine whether it is right or not; he simply contents himself with a vague feeling that it may be correct; he estimates the authority of the examiner higher than that of his memory.

Similarly the ambition of an observer changes the quality and quantity of an answer to some extent. Franken (22. pp. 214 ff). Kosog (29. pp. 71-72) and others have shown that the ambition of an observer increases with the range of his knowledge, increasing the extent of an answer but reducing its qualitative value. The reason seems to be that with

ambition the power of caution or criticism is checked and the childish imagination is intensified (29. pp. 71-72).

Closely connected with this group of reactions is a type of reaction traceable to the so-called counter or contrary suggestibility. This is a tendency to react, immediately, uncritically or critically, but always negatively, to the suggestion made. (39. pp. 372-374.) If such observers notice that a definite answer is suggested by a question, then they form the opinion that this answer will probably be false.

There is an acute type of this contrary-suggestibility which may be termed an inborn contrary-suggestibility. Here the mode of reaction approaches almost the negativism described by Kraepelin as "the instinctive resistance against every outer influence upon the will" (8. p. 10). As soon as such an one gets suggestion, he feels antagonistic; no idea suggested gives him any satisfaction and so he chooses something else, and the "something else" is apt to be the opposite, since "each idea suggests, as it were, a contrary idea as its natural complement" (8. p. 32).

However this tendency in children is not rebellion or conscious assertion of the self against an opposing will. "It represents rather that stage in the normal process of self-development in which the crude materials of rational action have been given, but in which successful co-ordination has not yet become possible" (39. p. 379). "But to have become the characteristic form of reaction in an adult is an indication of arrested development, since in proportion as this type of action predominates, the mind becomes blinded to the very basis of rational conduct. It must be utilized . . . . . to establish that habit of reflecting upon reasons for and against any suggested course of conduct" (39. p. 380).

Besides those above mentioned, there are still at least two types of reaction due to exercise or repetition. A question draws the attention of the observer to a given problem and gives rise to an idea of purpose (*Aufgabe*) to solve it. This idea of purpose conditions a certain mental state which may be called "Attitude or a definite reaction mood" (*Einstellung*) (33. p. 77). This attitude or mood, after several repetitions of reactions to the same stimulus in a definite way, is apt to develop into the purely mechanical or expectant mode of reaction.

The purely mechanical reaction or habit is found to play a great rôle in the well known abnormal or supernormal suggestibility of soldiers (50. p. 315), policemen, children and others, under strict discipline. Here the suggestibility is undoubtedly fostered by exercise. So, too, some observers

are found very often to acquire the habit of either a motor or vocal reaction, to a similar stimulus. If children are habituated to react with an answer "yes" to a "yes or no" question, they will be mechanized to this mood of reaction, and will answer without reflection but merely automatically, even when the content of a question is entirely changed from true to false.

To discover how an expectant attitude affects even normal questions, Lipmann (33. pp. 78-81) made another experiment which showed that the increase of error is greater in an experiment with a leading question as the first of a list of questions than in a series without such a question, which produces an expectant attitude towards the rest. Again an expectant attitude may affect suggestive questions in a peculiar way. For instance, after an observer has answered a number of normal questions in succession, he is apt to fall into the trap of a suitably formulated suggestive question, or questions where their suggestive character is not apparent (33. p. 77). In all these experiments it is hard to say how much of the results is to be ascribed to suggestive questions, and how much to an expectant attitude, but we may safely say that the expectant attitude has played an important rôle, since its function is to dull the critical power, which Rodenwaldt (50. p. 316) found stands in inverse ratio to suggestibility. There are cases, however, as in Seashore's experiments, where even the greatest caution will not ensure protection against skillful suggestion (56. p. 43).

Children's suggestibility may be due also to their lack of attention, defective observation, lack of language, etc., or all these factors combined. It is thus difficult to say that a particular result is caused by a definite influence. It is a teacher's function to investigate the suggestibility of each pupil and to make practical use of such knowledge.

Questions From the Pedagogical Point of View

Questions, as employed by teachers, may be divided according to their purpose.

1. The preliminary or experimental question aims to find out what the pupil knows. The teacher, by means of this class of questions, is able to arouse a pupil's curiosity and intellectual activity (21. pp. 76, 81).

2. The questions employed in actual instruction, by means of which the reasoning power of a learner is exercised are analytical or developmental. The purpose of the analytical question is to analyze knowledge into its elements in order to bring its implications to consciousness (19. pp. 180), while

the developmental question is to aid the pupil in arriving at a clear comprehension of classes, rules, principles, etc. It is especially applicable in the inductive approach to general truths, but equally serviceable in making verification of principles assumed (19. p. 181). These two types of question are generally employed in scientific studies or those which exercise reasoning power. Their aim is both to impart knowledge and to train purposive thinking.

3. The questions, through which a teacher tests her own work after a lesson has been given and ascertains whether it has been thoroughly understood, may be called disciplinary or 'examination questions.'

4. Very closely connected with questions for examination are those for review. Here the aim is to impress the facts taught upon children's minds.

5. Another type of question aims exclusively at drill, the establishment of a sort of mechanical association, as employed, for instance, in language studies. Here the attainment of a prompt reply is the sole aim. This type of question is unfortunately abused in our school recitations and often applied to subject-matter for which it is unsuited.

The most fundamental function of questions in most cases is didactic, that is, to stimulate thought in the direction of the solution of a problem, instead of mere verbal memory exercise, drill or habit-formation. It is to lead pupils to recall objects previously known, to bring to consciousness former experiences to give a new meaning. But unfortunately the belief in a "faculty of memory" has led popular educationists to an exaggerated estimate of the value of questions for verbal memory training. Certainly memory is a basal factor for all sorts of learning, as Miss Calkins says, "not only creative imagination but all forms of thought are based on memory." We are, however, skeptical of that sort of teaching which merely aims to equip children with a mass of fragmentary dissociated knowledge in order that they may later in life find a use for it. The teaching of children's memories must be based on rational understanding so that they may be able to control or direct their ideas toward some end, toward the solution of some problem.

According to Stevens' investigation (65. p. 47), an average number of questions during a History lesson of one period is ninety-three, for English, eighty-five; of the former 76.6%, and of the latter 49%, are based directly upon the repetition of the text-book. For example: When was the battle of Waterloo fought? When was Scott born? What kings of England led crusades? Now what do such questions suggest

to children? Will they not become merely an incentive to memorize by rote the words of the book, rather than to work out the problem and get ideas of their own? They do not stimulate reflection as do such questions as, for instance: Why do you like the Lady of the Lake better than Marmion? Why is it that Minneapolis could develop so quickly? Compare the quality of A with that of B. By pure memory questions pupils become apparently but not really self-active. Thus Scherer even went so far as to say that the apparently greatest perfection in the art of questioning has as its result the greatest dependency of the pupils (54. p. 27).

Over twenty-five per cent of the more than 300 returns to our questionnaire as to what school subjects were liked or disliked state that the writers liked English literature and History best, if the teachers did not bother them by silly questions on trifling facts and waste time without going into any interpretation or evaluation of the literature itself. This is clearly brought out in the following excerpt:

"I have had experiences in English literature where we were driven to stand and tell from memory the names of authors, when they were born, where they were born, how long they lived, what books they wrote, when they died, where they died, where they were buried, and so on along the same line. I myself at least was bored to death. I wonder what such study of literature can amount to? Absolutely nothing to me, yes worse than nothing, as I changed my purpose."

The burden that such a study inflicts upon pupils creates a hatred of literature often never overcome. The problem naturally arises, what questions then shall be used? The answer is: analytical and developmental questions, whether the method used be Socratic, inductive or deductive, topical or dialectic.

Dr. Dewey says that "a demand for the solution of a perplexity is the steadying and guiding factor in the entire process of reflection" (20. p. 11). It becomes thus a function of questions to present this demand for the solution of a definite problem as a first step. A general appeal, however, to a child to think, irrespective of his own experience or knowledge is futile. Experience is the anchor of both wisdom and sanity (13. p. 64). Given a problem, the next step is to stimulate thought by a series of interrogations leading each pupil to correct reasoning. This method may, in a certain sense, be called Socratic, but not in the sense which Socrates himself used it. Care should be taken in the use of the so-called Socratic method; for it is primarily intended for adults who have much experience, and moreover it is, in its nature, altogether too destructive. It discourages the child by break-

ing down his misconceptions, by revealing his ignorance or his absurdity, while it offers him little or nothing of constructive material. Consequently it is likely to force the mind to think along a negative rather than a positive line or to lead to indifference. We may, however, make use of it by rendering it simpler and more constructive (28. p. 376). The teacher stimulates and directs, but never suggests a conclusion or an answer. Pupils are encouraged to present their own thoughts. If correct, the teacher deepens and widens their views by suggestive illustrations. If incorrect, their absurdity is shown by leading them to discover legitimate consequences. Thus the learner at every step feels the joy of discovery and victory instead of discouragement. In all this the teacher is only the stimulator of the pupil's thinking. The secret is: "never suggest anything which you can lead a pupil to find out and tell you." Given a problem, suggestions in the mind of the child follow the laws of association. The greater the fluidity of ideas, and the greater the number of the suggestions that arise, the more likely is the true solution to be obtained; but all these may fail; then only may a questioner suggest the conclusion.

If any suggestion of an answer is given from without and accepted at once, there will be no critical thinking, simply a minimum of reflection. If this kind of interrogation continues for months and years, the child will become a puppet and passive in his thinking, instead of active, self-assertive, and independent of external suggestion.

Another pernicious practice is that of helping or directing pupils too much in their recitations by questions or otherwise. They are never left alone to direct their own steps, and are never afforded any opportunity of self-direction to develop sufficiently the power of initiative. Should it then be a matter of surprise that when left to themselves to think and to decide or solve a problem, they dawdle and get nowhere?

Another method of developing the power of purposive thinking in a pupil is by means of dialectic or discussion. In this method, the pupils present their arguments briefly and pointedly in favor of their respective positions. All criticisms are answered and contested. The reasons for and against are carefully weighed. In these mental conflicts, the utmost power of the pupil is called forth. It not only cultivates mental power, but also self-assertion, independence, courtesy and liberality toward an opponent, and the virtue of fair play. It supplements the so-called Socratic method, by making the pupils think. Of course this method is not applicable to young pupils, but to a certain extent and in somewhat modified form

it can surely be utilized for pupils of the later grades and the high schools.

Here it may be instructive to cite an experiment by C. H. King (27. pp. 158-9) on the reasoning powers of children. He gave the following two questions to children of from twelve to fifteen years of age. "The first question runs: There are several clever boys in this class and they are all careless, so a clever boy must be careless. Do you agree with this? The second question is: French people are excitable, so are Italians; so all foreigners are excitable. Is this true? The first question was solved correctly by 144 (44.4%) of all the children who answered, and the second by 172 (56.8%). He concludes that a considerable portion of those who have received a good education and have reached the age of fifteen years fail to show anything but the germs of logical thinking."

Why is this? Why should pupils fail in such simple reasoning? Are these problems beyond their powers? Certainly not.

The habit of reflecting upon the reasons for and against any problem should be promoted by a kind of dialectic method. By a series of suitable questions the pupils are led not only to pause before they react, but also to review or analyze the complex system of factors involved in the case, so that their reaction is made deliberate and rational; otherwise they become mere empirical thinkers, of whom, James says: "Whereas the merely empirical thinker stares at a fact in its entirety and remains helpless or gets 'stuck' if it suggests no concomitant or similar, the (analytic) reasoner breaks it up and notices some one of its separate attributes. This attribute has properties or consequences which the fact until then was not known to have, but which, now that it is noticed to contain the attribute, it must have." MacDougall says: "The ideal type of human action, which all conscious education seeks to develop, is that in which each novel situation is critically reviewed as it arises before it is responded to by an adaptive reaction (instinctive reaction)" (39. p. 381).

Questions may also be utilized to disclose the intellectual or emotional bias of an individual so that reactions or answers may be given without prejudice (34. p. 28). According to Freud, "our mental processes are more rigorously determined than is commonly believed, and many of them generally thought to be causeless have in fact a very precise and definable cause. The same remark applies to many mental processes where we believe that we have a perfectly free choice. Most important, however, is the extension of these principles to the sphere of human judgment, for it is probable that repressed complexes

play as prominent a part in distortion of our ideas. On a large scale this is shown in two ways, in the minimum of evidence often necessary to secure the acceptance of an idea that is in harmony with existing mental constellations, or to reject one that is incompatible with these. In both cases it is often the affective influence rather than the intellectual operations that decides the question. The same evidence is construed quite differently when viewed in the light of one affective constellation than when viewed in the light of another" (25. pp. 478, 524).

Wrong ideas and inappropriate propositions enter consciousness through many doors and should be corrected by the influence of opposite ideas which a faithful memory and a sound reasoning provide (43). But if pupils are not trained to look into things, to reflect for and against a given problem, and to judge it fairly, they will be at the mercy of their instinctive reactions and feelings.

The Qualities of Good Questions

It is of prime importance for a teacher to provide a certain mental background necessary for the lesson and harmonize it with her own so that both pupil and teacher may have a closely similar apperception, though not composed of the same elements (2. p. 95). Otherwise a problem under consideration may be looked at from wholly different points of view and there may be a mutual failure in understanding. This is the reason why the teacher so often fails to get correct answers from her pupils. For instance: "Where was St. Paul converted?" asks the teacher, speaking from a geographical point of view; but the pupil responds, "In the ninth chapter of the Acts," from a background of textual reference (2. pp. 95-96). Hence the necessity of bringing the teacher's own mental background into harmony with that of her pupils in order that the questions may be comprehended and answered correctly.

Moreover a question should be clear, concise and logical. The first requisite is its clear comprehension. If the question lacks clearness or is ambiguous, it occasions hesitancy and confusion, so that some children may decline to answer, even when they know the answer well. "An Ohio school teacher asked of her class one day a question, but did not draw the prompt response she expected. With some surprise she turned to one of the boys, saying, 'You know what I want you to say, Johnnie; why don't you say it?' Johnnie replied, 'I know what you want all right, but you ain't asked the question what fetches it." Here the youth, wiser than the

teacher, refused to yield up his store of information to an ambiguous question (65. p. 4).

Questions should neither be too universal nor too general. For instance: "Where is Chicago?" may bring out the answers—'In Illinois,' 'on Lake Michigan,' 'in the United States,' etc. All these answers have equal value for such a question.

All these vague questions admit of several equally good answers, according to the different points of view from which different minds regard them; but many teachers think that what is clear to them ought to be equally clear to others, so that when an answer is given contrary to their expectation, it is rejected, even though a perfectly legitimate one; while, if any pupil is fortunate enough to give the precise answer in the teachers' mind, he is commended and rewarded, even though he has given no more thought to the subject (21. p. 91). The really thoughtful and cautious child is merely bewildered by such questions. He remains silent and will be disgusted when an answer is given by his less worthy comrades. The second type is the pupil who is not very clever but shrewd as to the personal peculiarities of his teacher, watches her facial expressions, tone of voice, method and mode of questioning, etc., and discovers easily what she expects. The third type of learner takes a chance by answering at random without thinking it over. He is thus led to form a habit of guessing and insincerity.

Great simplicity of language is another condition. It is better to use as few words as possible, since the function of a question is not only to cause children to say as much as possible, but to avoid confusion, and a loose, pointless answer which is apt to result from a wordy question.

The questions should be adapted to the mind and experiences of the child. An intelligent teacher usually knows in advance which pupils can answer her questions, and this makes possible adaptation of the questions to the pupils. But, unfortunately, it too often happens that a teacher tries obstinately to elicit from the pupil's mind what is not in it. Whenever the question fails to fit the mind of the learner, it presents difficulty after difficulty, and causes embarrassment and confusion, which will cause some pupils to give up all attempts to reply and lead others to imitate their comrades or to reply at haphazard.

One girl says: "When I was in the eighth grade, our teacher used to ask such bewildering questions that most of the class could not understand, but she insisted upon our thinking until we hit upon what she had in her mind. If we did not at once hit upon her thought, her eyes became large and black, her voice harsh and her manner

made us feel as though we were the most unintelligent beings possible and as a consequence we became nervous, and gave up any attempt to solve or answer the questions." Examples of such bewildering questions can be found in many educational writings, and we cite a few of them here. Betts says: One teacher asked, "Which phenomena of the fratricidal strife in the American Republic were most determinative of the ultimate fate of the nation?" While in an elementary history class, another teacher propounded this question: "What American institutions have been founded on the principle of social democracy?" (4. pp. 66-67.) Now in all these questions not only the terminology, but the thoughts also are beyond the comprehension of the children. Such questions are not only useless, but confuse and discourage the children, and cause them to lose interest in study. How difficult it is to adapt questions to children is clearly seen from the following examples given as a model by a college professor in one of the largest American universities: "How long do you think it would take a man to walk to the top of a mountain? What would be the difficulties in getting to the top? If you stood on the top and threw a stone, how far down the mountain do you think it would go?" To the writer who was brought up among the mountains, such questions sound nonsensical.

Undoubtedly with many pupils under the conditions created by a series of ill-adapted questions, the brain becomes inhibitive or a storm center of opposing nervous impulses and the mind loses all docility. The following investigation may throw some light upon this point. In 1909, Miss Helen Todd (67. pp. 73-74) took 500 children from twenty different factories and asked them the question: "If your father had a good job and you didn't have to work, which would you rather do—go to school or work in a factory?" Four hundred and twelve said they would rather work in a factory and gave among others the following reasons: "Because it is easier to work in a factory than it is to learn in school;" "You never understands what they tells you in school, and you can learn right off to do things in a factory;" "They ain't always picking on you because you don't know things in a factory;" "It's so hard to learn;" "I couldn't learn;" "When you works a whole month at school, the teacher she gives you a card to take home, that says how you ain't any good."

These cases might be diminished by well-adapted questioning which will give a child success and hence pleasure and an incentive for further attempts. Every teacher has noticed with what enthusiasm and vigor children take up different tasks in their school lessons after they have been successful in the solution of some problem. "Not all the coaxing, or scolding, or moralizing in the world would fit them half so well to take up the new work, as the victory already won" (12. p. 112). Belief in power begets power, in weakness, begets weakness. Upon self-confidence depends the mental development of the child (47. p. 267). Hence it is important for mental hygiene

to give children a chance for success, and to arouse self-confidence in their ability; and this is the very task of questioning. It goes without saying that it is also important to allow a slight failure once in a while as a specific medicine. Meumann illustrates the importance of the self-confidence of a child in his own power from the experience of a boy whom he knew.

When a thirteen-year-old boy entered a new school, his previous teacher who had an antipathy to him, introduced him to the new teacher in a tactless manner with false report. From that moment the boy, who so far had done work above the average, could do nothing more, his intellectual efforts diminished from day to day, behavior deteriorated, and he became shy and depressed. At the end of the year he failed to be promoted, and would have gone to pieces, had not his parents taken him away. In the new school he met a teacher who showed confidence in him, and from that moment he changed completely, and left the school as one of the best pupils. Meumann gives this case as typical in that a single definite volitional inhibition entering into the life of the child, extended to his whole inner nature, discouraged his self-confidence, depressed his affective life, and decreased all his performances intellectual as well as moral (42. p. 298).

The effectiveness of such a volitional inhibition is most easily observed in the psychological laboratory-tests on immediate retention (42. pp. 298-300). We cite also one of our questionnaire returns.

A girl writes: "Behind the teacher's tones and expressions I have usually been able to read her attitude to the class and towards myself. When I know that a teacher has entire confidence in me and expects a certain response on my part, the most difficult subject becomes easy to me. On the other hand, when a glance tells me that my ability to answer is questioned, no matter how carefully the lesson has been prepared, my power over the subject seems to depart, and I fail in general."

Children are very susceptible to such volitional inhibitions; and such an inhibition is too frequently caused by ill-adapted questions which simply bring about failure after failure, or by the unsympathetic sarcasm of the teacher or the like.

Questions Should Not Be Numerous

A multiplicity of questions is likely to discourage and fatigue children because of the monotony of the procedure. According to Stevens' investigation, already referred to, the number of questions in one recitation period is, on an average, 85.3 for English, 81.2 for History and 81.4 for Science. That is, the children are asked about two questions per minute. Embarrassment, repulsion, constraint, weariness, etc., will often be the outcome of such a method of numerous questions,

as the following excerpt illustrates: "There is one teacher who asks question after question and does nothing else for a whole period; and everything becomes monotonous and one feels really wearied so that one can not understand what is going on." Another girl says: "As a result of too many questions we become indifferent;" still others say that they become nervous and impatient.

Effectiveness and leadership in social life depend on the ability to express one's self adequately on the topic under consideration. But in the schoolroom the number of questions, whether good or bad are apt to be so large that there is no time left for complete expression of thought. The pupils are allowed merely to punctuate the questions with monosyllabic answers, or with a few words. The following example from a lesson on "The Lady of the Lake" will illustrate the point (65. pp. 38-42, 66). The number of questions asked in one recitation period was 105 out of which 60 were answered with less than five words:

T. We will see; hold your judgment until the end, and see. How much is description used in the story, Mr. J.? Is there very much?
P. Quite a little.
T. For what did it seem to be put in?
P. I think one place the Canto starts very quietly, and then the clan gathered in the fiercest preparation, terrible oaths, shows contrasts.
T. Is it put in then, just as a scene, or for some distinct purpose?
P. Distinct purpose.
T. And in this case it was?
P. Contrast.
T. What other descriptions?
P. Nature.
T. Very much space taken up with descriptions of nature?
P. Yes.
T. Have you a pretty fair idea of the country?
P. Yes.
and so on.

The questions should be made so that every child may have frequent incentives to answer in well-articulated sentences. Dr. Lay says (32a. pp. 303-4) that "too great emphasis has been put upon questioning without thinking, that in the schoolroom is fostered a form of conversation that has an analogy in the court room alone. He further says: "The natural form of conversation should be preserved in the schoolroom, especially, since the question is unpleasant or even painful to most children. The child must have freedom to follow his own thought process, not that of the teacher." And for this purpose, description, narration, and exposition, or in other words, the method of our spontaneous report is very desirable. We are, however, by no means inclined to

slight the questions and questioning, but simply to guard against the use of too many fragmentary questions. An interchange of all these methods of description, exposition, narration and good questions contributes to freshness and interest. It is, of course, too much to demand a complete sentence for every question, and again it is pedantry to banish all questions that can be answered by "yes" or "no." We need, however, to be sure that a sufficient reason follows or precedes the answer, so that the 'yes,' or 'no' may neither be a mere guess nor an automatic expression.

Here it may be worth noting that the teacher who accepts vague and indefinite answers incidentally encourages slovenly habits of thought and fosters guessing. A child is quick to take advantage of the teacher who will accept any sort of an answer and interpret it as a statement containing thought. Indeed, a child may even come to think that his incoherent statements, his word juggling, really represent thought (66. pp. 110-111). Worse than this is the danger that a teacher may lead the child to insincerity of speech. Instead of truth, he will have appearances; instead of real powers, presumptuous weakness; instead of sincerity, hypocrisy.

Again, it seems even better to permit the pupil to blunder through to the end of his recitation and correct him than to disturb him in the midst of his speech.

A Normal School girl says: "A certain teacher I once had was very impatient. Before I would go to the room I would know the lesson almost word for word. When she called on me to recite, if she did not interrupt me, I could finish the recitation, but as soon as she began to ask many questions and then scold if they were not answered correctly, I would forget the work which I had before known so thoroughly, and as a result would fail." (Thirteen cases.)

Moreover the method of numerous questions means that things and their qualities are torn apart, retailed and detailed, without reference to their more general character, and thus the child is not only hindered from seeing the "forest on account of the trees," but also the firm retention of the subject-matter is rendered very difficult (20. p. 97).

Time Should Be Given for Answering

Rapidity in questioning intensifies the attention of children to great advantage and is undoubtedly necessary for pedagogical purposes, but its dangers should not be overlooked.

First of all, speedy questioning emphasises the quantity instead of the quality of the work. When a teacher demands of each pupil to answer quicker than the other for the sake

of a brilliant showing, a premium is put upon feverish activity, regardless of the cost to the pupils. According to the experimental results of Hillgruber (1), Rusk (52), Meumann and others, under the compulsion to work as quickly as possible, the amount of work will be far greater than that obtained without such force. Ach (1. p. 2) says: "It is due to the law of difficulty as motivation, that is, to the fact that the difficulty of a forced task motivates a more intense effort of Will and concentration of attention on the present problem." "With the increase of the difficulty," he continues further, "the effort of Will increases instinctively and acts in favor of the work quantitatively." But another aspect of their experimental results confirms our theory as well as Meumann's that under the influence of the compulsion to work as quickly as possible the quality of the work deteriorates. This is certainly due to the interference of association caused by excitement, confusion, lack of time, etc. It is obvious that sufficient time is needed to comprehend the questions correctly and to make correct comparison, discrimination, and true inference as well as call forth right associations or to make orderly associations with the old. The child needs a longer time for individual ideation, and the ideas with which the child works are not at prompt disposal for him in spite of his accurate possession (42. p. 231).

Meumann found from his experiments that when rapidity of response is a controlling factor, a stimulus word is comprehended in the most cursory fashion, so that the reproductions are of little value, but with lengthening of the reaction time in general is noted an increase of the qualitative value of the work. He concludes that for tests with a problem to be solved, the instruction "as quickly as possible" is detrimental (42. p. 232). The results of Rusk indicate that for different children the speed of association has little value as an indication of the intelligence of the learner (52. u. 102). The children who reply most quickly are not necessarily of the highest intelligence. An exceptionally good memory is often found to co-exist with very low intelligence (52. p. 151).

On the other hand, Müller and Pilzecker, and Bigham (5. p. 458) also, found that right associations are reproduced more quickly than false; in other words, those ideas which can be reproduced easily are usually truer than those whose recall is difficult, whether this be due to pure forgetfulness or to the confused association with kindred ideas. This again shows that questioning should not be too speedy, since speedy

questioning will overlook the false association that should be corrected and cleared.

The experimental results of Franken (22. pp. 239-243) tell us that the lengthening of the time for reflection (*Bedenkzeit*) brings about a quantitative increase but a qualitative degeneration, since the increase of right answers is smaller than that of false ones. This result apparently contradicts our theory, but a closer study shows that there is no conflict, but agreement. In Franken's experiment, the observer gave only those answers that were most clear and certain to him, and with the brief interval for reflection, all doubtful answers are rejected. (22. pp. 227-229.) Furthermore his result shows, that the mean variation varies with the length of the time for reflection; it increases if the time is lengthened and decreases if this is shortened; that recollection needs a certain time, and if, before its process is complete, questions and hence ideas and answers, crowd themselves in consciousness, the recollection will be disturbed and hindered (22. pp. 227-9; 241).

Second: rapid questioning ignores individual differences (59. p. 215), and consequently fosters shallow thinking or guessing. What one pupil solves in a second, another may spend a minute in solving (3. p. 243). Meumann says that: "The concrete thinking of a child is surprisingly slow; in some cases, he takes almost ten times as long as the adult to respond to a stimulus equally familiar to both" (42. pp. 227-8). Children who are more ambitious are apt to answer more quickly than others. Temperament also makes a great difference. The results of Rusk's experiments also disclosed great individual differences in the rates of reaction. For example, an investigation with three boys of the same age and intelligence revealed the fact that one of the boys invariably took three times as long as the other two to respond to the stimulus words. The work presented no difficulty, yet his normal rate of reaction was considerably slower (52. pp. 102-3). The teacher of these three boys, although they had been under his care for years, was unaware of any such difference, and probably, in oral questions, this boy owing to his slower rate of response, would appear at a disadvantage (53. p. 837). Bader (3. pp. 102-104) obtained similar results, among his five observers those whose reaction-time was shortest gave the poorest answers.

Furthermore, what effect does a demand to answer "as quickly as possible" have upon the mind of the child? Bader's experiment teaches us that the observer focuses his attention on the act of answering quickly as a result of

pressure. Thus those whose natural disposition forces them to a quick reply are still more incited by the stimulus and give flippant, unconsidered answers, while those who are by nature reflective feel in the procedure an unaccustomed impulse (3. pp. 243-4). In both cases, as a result, quickness of solution takes place at the cost of quality. To make these results clear, let us cite a few introspective reports of Bader's observers: observer E says: "The task of replying quickly influences consciousness and drives me to do so." Observer F says: "The idea, 'you must reply as quickly as possible,' is always very vivid and governs everything else." F further says "I do not know why I have said that word. Oh, yes, in an endeavor to answer as quickly as possible, I did not take time to give a sentence, but brought quickly merely a word." B says: "I would have answered differently. At all times I was clear that it (the answer) was false, but I thought that I needed too long a time to do otherwise; and hence I spoke so quickly" (3. p. 100).

Any demand for speedy reactions deprives a child of time for suspension of judgment and weighing the evidence pro and con; it prevents him from appealing to concrete experience latent in his mind, but encourages him to accept any suggestion from within as well as without and to react at random. As a result such a method may bring about mental automatism, a habit of instinctive, premature reaction. We should keep in mind that the class room is not a vaudeville stage for displaying or rehearsing the mere strength of verbal memory, but a laboratory for testing, getting, verifying, using and developing knowledge, in a word, for the training of purposive thinking.

It is the function of questioning to make children understand first of all the meaning of the question and to make an orderly association between the question and ideas in the answer. A question erroneously comprehended may not only evoke the wrong answer but may also cause an interference of association. Now it happens quite often that when a question is asked under the spur of answering quickly, many children raise their hands first and then think about the problem. The answers are given frequently before the question is fully understood. With frequency of such a mode of questioning and answering, the child may finally become habituated to a mode of thinking in which the attention, critical insight and examination of the inner process present between the question and answer is neglected.

From what has been said it follows that the rate or tempo of questioning should be carefully considered for different

ages and classes of children so as to allow just sufficient time for good reaction. (52. p. 104.)

It is a matter of course that when questions are put for the sake of drill or of the review upon memorized matter, they may be asked with emphasis and rapidity; but even then, the individual differences in reaction time and the influence of the command to answer "as quickly as possible" upon the observer should be kept in mind.

A large number of rapid questions is injurious both to mind and body. As Stevens says, "a large number of rapid questions keeps children in a highly strung nervous tension where there should be natural and normal conditions (65. p. 171). It is certainly injurious to the nervous organism to live in such a high-pressure atmosphere."

One girl says: "One of my teachers by her mode of speedy questioning causes me to put all of my mental powers on the questions in hand. After spending an hour with that teacher I feel really tired and nervous so that I can not do anything until I have time to recover from my nervousness."

Another girl reports: "There is a teacher who affects me very much. When I enter her room I am as calm and composed as anyone else should be, but when I leave it I am worked up to such a nervous pitch that I am almost unable to go on with the work of the next hour. It is caused, I believe, by the teacher's incessant calling upon us for answers and recitations." (Seventeen cases.)

Some individuals can do mental work with far less waste of energy than others even under pressure, but most of us are apt to be made nervous and excitable by undue nervous stress. In some cases, excitement, fatigue and anxiety may cause the beginning of pathological neuroses.

A girl reports: "At one time I had a teacher who was extremely nervous. When she called on her pupils for answers and recitations, she hardly gave them time to recite or answer by calling for answers, but she would supply words; and just by her whole manner and her mode of questioning she made her pupils so nervous that some forgot everything they knew, some became restless and some of my classmates gave way even to the nervousness in spells of crying."

It is especially noteworthy that this speedy habit of reaction and thinking formed by such a method may persist even till late in life and hinders the victim from quiet, deep, and connected thinking.

Some teachers may say that the ability to concentrate attention on a problem should be cultivated, and hence speedy questions must be used. It is certainly true that the attention of a child is very likely to be dulled by even a few minutes' exposition and that it is aroused by animated questions; but we must not forget that a multiplicity of speedy questions also tires and disgusts the children. After a few minutes,

their attention again flags; they will no longer listen to the inquiries of the obstinate questioner, and they will answer only at random, thanks to the defensive mechanism of nature. Hence the method of rapid questioning will rather kill than form the habit of attention. Attentive moment and relaxation-moment should alternate. Above all, it is desirable that attention be paid to the meaning of the question and to the quality of an answer, not to the form of the question nor to the teacher.

Too slow questioning is, however, detrimental for the education of the will (1. pp. 3-4). The best method may, as Ach suggests, be to let children work at times under the spur of obtaining good results as quickly as possible but with intervals of relaxation. This method conditions an increase of the effort of the will and brings about the best result both qualitatively and quantitatively (1. p. 3).

Still another point to be considered is that sometimes even the brightest children and some adults too fail to answer in spite of knowledge, when asked a question suddenly, unexpectedly, or at an examination. The writer's own experience and observation show that such a question causes a sudden arrest of psychic activity, or that there arises out of unconscious complexes an apparently unrelated idea. Thoughts refuse to flow freely, only to lead one to an utter failure, even when well prepared in the subject. The nerve centres for the time seem paralyzed; as soon as one is alone or with a sympathetic friend, the obstruction gives way, and clear-cut correct answers which he might have given in reply to the questions raised are readily thought of.

Psychologically such a sudden mental arrest may be due to fear, excitement, a feeling of unpreparedness, lack of self-confidence, timidity, shyness, embarrassment, or excessive ambition.

Whatever the cause may be, the fact remains the same. It is absurd to judge children's mental ability through the answers to such questions. Moreover a failure may injure their future work through volitional inhibition.

In conclusion it may be wise to add that for individuals who have a normal nervous system, adequate nutrition and abundant rest, and especially plenty of sleep, excitement and explosion of energy once in a while may be as essential as rest and the storing of energy. Normal children must be trained to work occasionally under pressure so as to be prepared for the struggles of their future life. To shield pupils entirely from tests of strength is to rear them in weakness and timidity (44. p. 118).

Finally, the limits which should be observed in the rate and tempo of questioning and in regard to the functions of questions in general, that they may be useful and not harmful to mental development are problems to be studied seriously by every teacher.

Conclusion

Experimental evidence from our own investigations and those of others give the following tentative results:

1. Children attempt the *Bericht* with a different mental attitude from what they have toward the *Verhör;* for example, some children reported correctly in the *Bericht* what they answered wrongly in the *Verhör,* while other children make false statements in the *Verhör* in regard to what they reported correctly in the *Bericht.*

2. The weakness of the *Bericht* seems to be the outcome of three factors. (1) Pedagogically, it appears to be due to passivity of the mind induced by habituation to the questioning method and lack of initiative. (2) Psychologically, it may be due to interference or weakness of association that children fail to recall in the *Bericht* what they can by the aid of questions. (3) It is undoubtedly in part due to the fact that children's interest is not equally distributed to each detail, and hence they fix their attention on the more interesting facts.

3. The large number of errors in the *Verhör* is due not only to the passivity of the mind and the suggestive character of the questions, but also to the fact that children's mode of viewing things is wholly different from that of adults, while the questions are asked from an adult point of view.

4. The experimental results show that many children can do better in the *Bericht* than in the *Verhör.* In view of this fact is it justifiable to determine the grade of children by the questioning method alone?

Summary of Practical Inferences

1. The *Bericht* is far more trustworthy than the *Verhör,* but the range of the former is far smaller than that of the latter.

2. Either method is defective for testing children; both should go hand in hand.

3. All questions, whatever their form, have a suggestive influence; and hence children should be trained to guard against suggestion and to react to the content and not the form of questions.

4. Children are suggestible to external as well as internal stimuli. They should be trained to withstand unfortunate suggestions.

5. Children should be trained to formulate questions themselves on what they have to learn or have learned.

6. All questions, except those for drill and experimentation, should be for purposive thinking.

7. The rate and tempo of questioning should be regulated according to the subject matter and the individual differences in reaction time.

8. The number of questions should not be too numerous.

9. Questions should neither be too difficult nor too easy, but well adapted to the pupil's mind.

10. Questions should be clear and logical.

11. They should be given in few words.

12. Vague, indefinite, and fragmentary answers should not be accepted.

13. If possible to avoid it, an answer should not be interrupted.

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APPENDIX

The questions used in the experiments described above are based on the section (p. 259) on the Guianas in C. C. Adams' Elementary Geography and the section (pp. 18-19) on the Surface of South America in A. E. Frye's Grammar School Geography. "The Guianas: The three Guianas (B. D. and F.), are mainly devoted to the growing and manufacture of cane-sugar and its by-products, rum and molasses. Cultivation is confined almost wholly to a narrow coast strip, where most of the people live. Owing to the decline in the price of sugar the British and Dutch planters are replacing sugar-cane to some extent with coffee and cacao. An important amount of gold is mined in the interior, the British producing the larger part of it. Georgetown and New Amsterdam, the chief towns of British Guiana, owe their importance to the palmy days of the sugar trade. Great Britain and the United States take nearly all of the exports of this colony—sugar, gold, rum, rubber, rice, and molasses. Great Britain supplies half and the United States one fourth of the manufactures, food, and coal imported. Paramaribo is the commercial center of Dutch Guiana, nearly all of whose trade is with the Netherlands. French Guiana (port, Cayenne) is less developed than the other colonies, and includes phosphates among its exports. Its trade is mainly confined to France."

A. Tell what you know about the colonies of the three Guianas. (For the *Bericht.*)

B. Series of questions for the *Verhör:*

1. To what manufacture are the three Guianas mainly devoted?
2. What by-products are obtained from that manufacture?
3a. Do most of the people of the Guianas live along the narrow coast line?
3b. Do most of the people of the Guianas live in the interior?
4. What are the British and Dutch planters planting in place of the sugar-cane?
5. Why do they do that (referring to question 4)?
6a. Is an important amount of gold mined in the interior?
6b. Is an important amount of gold mined on the coast line of the Guianas?
7a. Does British Guiana produce the larger amount of gold (than the other Guianas)?
7b. Does British Guiana produce the smaller amount of gold (than the other Guianas)?
8. Mention the names of the chief towns of British Guiana.
9. To what do those towns owe their importance?
10a. Is the cultivation of the sugar-cane confined almost wholly to a narrow coast line?
10b. Is the cultivation of the sugar-cane confined in the interior of the Guianas?
11. What products are exported from British Guiana to Great Britain and the U. S. A.?
12. What things are exported from French Guiana?
13a. Isn't French Guiana less developed than the other Guianas?
13b. Isn't French Guiana more developed than the other Guianas (other colonies of the Guianas)?
14. What things are imported from Great Britain and the United States to British Guiana?
15. What is the commercial center of Dutch Guiana?

16a. Isn't the trade of Dutch Guiana chiefly confined to the Netherlands?
16b. Isn't the trade of Dutch Guiana chiefly confined to the U. S. A.?
17. With what country does French Guiana mainly trade?
18. What is the chief town or port of French Guiana?

South America has the shape of a triangle towards the south. Its coast is not so broken as that of North America. In general the surface of South America resembles that of North America. Each has its greatest or primary highland on the west, with lesser highlands on the east, and a great plain between. The highland which lies along the west coast of South America is known as the Andes highland, or simply the Andes. It is not nearly so wide as the Rocky mountain highland, but it has much higher plateaus. Over the eastern part of South America spreads a low but broad plateau, not nearly so high as the Andes. This plateau is mainly in the eastern half of a country called Brazil and is known as the highland of Brazil. The western half of Brazil is part of the Central plain and contains vast forests called selvas. Most of the trees grow in the lowlands along the rivers that form the Amazon system. The Amazon river and its branches drain the largest river basin in the world. The selvas are in this basin. Most of the largest rivers of the Amazon system flow from the Andes highland. The part of the Central plain south of the selvas is grassy and supports millions of cattle and horses. In that land such grassy plains are called pampas. The parts of the Central plain north of the selvas are called 'llanos,' meaning level land. There also the people raise many cattle.

A. Tell what you know about the surface of South America. (For the *Bericht.*)

B. Series of questions for the *Verhör* are as follows:

1. What is the shape of South America?
2. Which part of South America is widest?
3. The coast of Australia is regular, that of North America is irregular. How is the coast of South America?
3a. Is the coast of South America less irregular than that of North America?
3b. Is the coast of South America as irregular as that of North America?
4. Towards what direction does South America taper?
5. In what part of the country does a great plain of South America lie?
6. Along what coast of South America does the primary or greatest highlands lie?
7. What is the name of that primary (or greatest) highland?
8. Compare the height of that primary highland of South America with that of the Rocky Mountain highland.
8a. Has not that primary highland much higher plateaus than the Rocky mountain highland?
8b. Has not that primary highland much lower plateaus than the Rocky mountain highland?
9. Compare the width of that primary highland with that of the Rocky mountain highland.
9a. Is that primary highland of South America narrower than the Rocky mountain highland?
9b. Is that primary highland of South America as wide as the Rocky mountain highland?

10. Over what part of South America does a low but broad highland (or plateau) spread?
11. What is the name of that low but broad highland?
12. Why is it so called?
13. South America has highlands and lowlands. Where do most of trees grow there?
13a. Do not most of the trees in South America grow on the lowlands?
13b. Do not most of the trees in South America grow on the highlands?
14. How large is the Amazon river basin compared with the other rivers in the world?
15. From what highland do most of the largest rivers of the Amazon system flow?
16. What country has a surface very similar to that of South America?
16a. Does the surface of South America differ from that of North America?
16b. Does the surface of South America resemble that of North America?
17. Locate the grassy plains of South America.
18. What is the grassy plain of South America called?
19. In what regions are most of the cattle raised in South America?
19a. Do the people of South America raise many cattle on the plain?
19b. Do the people of South America raise many cattle on the highland?
20. What part of South America is called 'llanos?'
21. What does 'llanos' mean?
21a. Does not 'llanos' mean highland?
21b. Does not 'llanos' mean level land?
22. What are the vast forests in Brazil of S. A. called?
23. In what river basin are those vast forests?
24. Which half of Brazil is a part of the central plain?
24a. Is the western half of Brazil a part of the central plain?
24b. Is the eastern half of Brazil a part of the central plain (of South America)?

THE VOCABULARY OF A CHILD AT FOUR AND SIX YEARS OF AGE

By Eugene C. Rowe and Helen Niles Rowe

That sinecure of the elementary school—the language lesson,—is such not because of any malfeasance on the part of the teacher but because of the helplessness bred of ignorance. To stimulate and control language development intelligently and skillfully, necessarily demands a knowledge of the laws of language development. Perusal of the chapters on language in the pedagogical text-books, however, still shows a dearth of such knowledge. It seems clear that to become practically more fruitful the psychology of language, still in its infancy, must become genetic. This in turn necessitates the careful gathering of much concrete data, the analysis of which may yield the required laws and knowledge necessary for skillful guidance.

It is with the hope of contributing some small "pepper-corn" to the data required for a genetic psychology of language that the following vocabulary, taken at the age of four and again at six, is here presented.

The plan used was the following: Some one with a notebook and pencil, usually one of his parents, was with S. from the time he awoke until he went to sleep recording each word used. This was begun on the fourth birthday and kept up for ten weeks. The same process was repeated and for the same length of time, beginning on the sixth birthday. To make sure that the complete vocabulary was obtained this work was in each case supplemented by going through an abridged dictionary and listing all words known to have been used by S. and not already recorded. Only a few words—perhaps twenty-five—were added from this source. Excepting proper nouns S. used practically his entire vocabulary at four and again at six within a period of ten weeks.

Only the spoken vocabulary is here included, no attempt being made to secure a list of terms understood over and above those actually used. S. used very little baby talk and what had been used had practically disappeared by his fourth birthday. Such terms are not included. It was hoped that the vocabulary might be taken again at eight but this plan had to be abandoned because practical demands made it impossible to follow S. to school morning and afternoon for a period of weeks.

Words at Four Years of Age.

A

able
about
ache
aches
across
act
acting
actually
add
added
afraid
after
after-noon
afterward
again
against
age
agent
ago
ah
aim
aimed
aiming
air
alarm
alarm-clock
alive
all (n & v & adj)
alley
alligator
allow
almost
alone
along
aloud
already
always
ammunition
among
amount
an
and
animal
another (a & pro)
answer (n & v)
answering
any, (a, adv, pro)
anybody
anyway
anywhere
apple
apple-sauce
apple-tree
April-fool
apron
are
armed
armful
army
around
arrange
arrest
arrow
arrow-head
artichoke
as
ashamed
ashore
aside
ask
asked
asking
asleep
asparagus
at
attack (n & v)
attention
attic
aunt
automobile
avenue
awake
away
awful
awfully
awhile
awoke
axel

B

baa
baby
baboon
bacon
back (n & adv & a)
backing
bad
badly
bag
bait
baited
bake
baker-man
ball
balloon
bamboo
banana
band
bang
banister
bank
banner
bantam
barber
barb-wire
bare
barely
barn
bark (n & v)
barrel
basket
basket-ball
basin
base
base-ball
bass
bass-wood
bat (v & n)
bath
bathe
bathing
bathing-suit
bath-robe
battle
bay (a & n)
bay-window
bazaar
be
beach
bead
beak
bean
bean porridge
bear (n)
beard
bear-skin
beat
beaten
beauty
beautiful
became
because
bed
bed-room
bee
been
beech
before
beet
beetle
beg
begin
beggar
behave
behind
believe
bell
belong
belt
bench

berries
beside
best
bet (n)
better
between
bib
bicycle
big
bigger
biggest
bill
billet
bind
birch-tree
bird
bird-nest
birth-day
bit (v)
bite (v)
bitter
black (a & v)
black-berry
black-bird
black-board
blacksmith
blade
blanket
blaze
blazing
bled
blind (a & v)
blind-fold
blister (n & v)
blocks
blood
blow (n & v)
blowing
blow-pipe
blue
blue-bird
blue-jay
blunt
board
boat
bobolink
bobs
bob-sleigh
bob-white
body
boil
boiler
boldly
bon-fire
bones
bonnet
book
book-case
boom
boots
border
bore
born
borrow
both
bother
bottle
bottom
bound
bounding
bow
bowels
bowl
bow-wow
box
boy
brace
bracelet
braid
brake
brake-man
branch
brass
bread
break
breakfast
breakfast-food
breath
breathe
breathing
breeches
breeze
brick
bridge
broadwalks
broke
broken
broncho
broom
brother
brown-bread
brush
brushes (v)
bubble
bubble-pipe
buck
bucket
buckle (n & v)
buckwheat
bud
buffalo
bugger
buggy
build
building
built
bullet
bull-dog
bumble-bee
bump (n & v)
bumping
bun
bunch
bunched
bunny
burdock
burn
burned
burr
bush
bushel
bushes
bushy
busy
but
butcher
butter
butter-cup
butter-fly
butternut
button (n & v)
button-hole
button-hook
buy
buying
buzz
buzzing
by
by-and-by

C

cab
cab
cabin
cabinet
cackle
cackling
cage
cake
calf
calico
call
calling
came
camera
camp
camp-fire
camphor
can (n & v)
candy
candle
candle-stick
cane
cannon

canoe
cap
captain
car
card
card-case
care
careful
carpenter
carpet
carriage
carrier
carrot
carry
cart
cartridge
case
cast
castoria
castor-oil
cat
catch
catching
caterpillar
caught
Catholic
cattle
cave
cedar
ceiling
cellar
celery
cent
chafing-dish
chain
chair
chance
change
channel
chap
chapel
chapped
charcoal
charge
chariot
chase
check
checkers
check-book
cheese
cherries
chestnuts
chew
chewing
chickens
chiffonier
chip
child
children
chilly
chin
Chinaman
chinese
chip
chipmunk
chirp
Christmas
Christmas-tree
chocolate
choice
choke
choose
chop
chunk
church
churn
cider
cinder
cigar
circus
city
clam
clap
clapping
class
claw
clay
clean
clear
clerk
climb
climbing
clippers
cloak
clock
clog
cloth
clothes
clothes-pins
clothes-line
closet
clouds
cloudy
clover
clover-blossom
club
cluck
clucking
coal
coal-car
coal-man
coal-scuttle
coat
cobbler
cob-web
cocoon
cock
cocked
cocker
coffee
coffee-pot
cog
cold
colder
coldest
collar
color
colored
comb
come
comfort
comfortable
coming
comes
company
companion
conductor
cook
cooked
cooking
cookies
cool
coop
copy
cord
core
cork
corn
corn-cob
corn-flakes
corner
couch
cotton
cough
coughing
could
count
counting
couple (n & v)
coupling
court
cousin
cover (n & v)
cow
cow-boy
cozy
crab
crack
crackers
cranberries
crash
crawl
cream
cream-of-wheat

cried
cricket
cripple
crock
crooked
croquet
cross
cross-gun
crossing
crochet
crouch
crouching
crow
crowd
crowding
crown
crows
crumb
crumple
crust
cry
crying
cub
cucumber
cuff
cuff-button
cunning
cunningest
cup
cupboard
cupfull
curb
cure
curl
curly
currants
curtain
curves
cushion
custard
cut
cutting
cute

D

daddy
dagger
damp
dandy
dandelion
danger
dare
darling
dark
darky
darn
dart
dash
dashing
dashed
dasher
date
daughter
day
daylight
deal
dear
dearly
deep
desk
diamond
dickie
dictate
did
die
died
different
dig
digging
dike
dim
dimple
ding-dong
dining-car
dining-room
dinkey
dinner
dinner-time
dip
dipper
dirt
dirty
dish
dish-pan
dizzy
do
dock
doctor
does
dog
doing
doll
dominoes
done
donkey
door
dot
double
dough
dough-nut
dove
down
down-hill
down-stairs
dozen
drank
draw
drawing
dream (n & v)
dreamed
dress (n & v)
dress-maker
drink (n & v)
drinking
drive
driver
drop (n & v)
dropped
dropping
drug-store
drum (n & v)
drumming
duck
dug
dull
dulled
dump
dumped
dumpling
dust
dusty
Dutch
Dutch Cleanser
Dutchman
dynamite

E

each
ear
early
earth
easily
east
Easter
easy
eat
eaten
eater
egg
egg-beater
either
elastic
elbow
electric
electricity
elephant
elevator
elm-tree
embroider
else
empty
end
ended
enemy

engine
engineer
enough
envelope
errand
escape
escaped
Eskimo
even
ever
every
everything
express
express-office
excuse
eyes

F

face
fact
faculty
fair
fairy
fall
false-face
family
familiar
fan (n & v)
fanning
far
farther
farthest
fast
fastened
faster
fastest
fat
fatter
fattest
farther
faucet
favorite
feather
feeble
feed
feel
feet
fell
fence
ferry-boat
few
fiddle
fiddle-de-dum
field
fig
fight
figures
fill
filled
find
fine
finger
finger-nail
fire
fire-alarm
fire-cracker
fire-engine
fire-man
fire-place
first
fish
fish-hook
fish-line
fishing
fishing-line
fist
fix
fixing
fixed
flag
flames
flannel
flap
flat
flat-iron
flesh
flew
flint
float
floated
flock
flood
floor
flower
flour
fly (n & v)
flying
fog
foggy
fold
folded
followed
following
food
fool
fooling
foolish
foolishness
foot
foot-ball
for
forget
forgotten
forehead
forenoon
fork
fought
found
fountain
fox
foxy
fractious
free
freeze
freezer
freezing
fried
fried-cake
fright
frighten
frightened
frisk
frog
from
front
frost
froze
fruit
fry
frying
full
fullest
fun
funny
fur
furry
furnace

G

gallant
gallop
game
garden
gasoline
gate
gave
gee
gems
gentleman
get
get-up
getting
girl
giraffe
ginger
give
gizzard
glad
glass
gnaw
gnawing
go
goat
gobble

gobbler
going
gold
golden
gone
good
good-bye
good-night
goop
got
gorilla
grackle
graham
graham-bread
grandma
grandpa
grape
grape-juice
grape-vines
grass
grate
gravy
gray
grease
greasy
great
green
grew
grind
grizzley
groceries
ground (n & v)
grow
growl
grown
grunt
grunted
grunting
guard
guess
gull
gulp
gun
gun-barrel
gun-boat
gun-powder
gymnasium

H

ha
hack
had
hair
hair-brush
hair-pin
half
halibut
hall
ham
hammer
hammock
hamper
handfull
handkerchief
hands
hang
hanging
handle
hand-organ
handsome
handy
happen
happened
happy
hard
hardly
harness
has
hat
hatch
hatched
hatchet
have
hay
haystack
he
head
headache
head-guard
head-light
heap
hear
heard
heart
heaven
heavier
heavy
heels
hello
help
hem
hen
her
herd
here
hero
herself
hey-diddle
hiccough
hickory
hid
hide
hiding
hide-and-seek
high
highest
higglety-pigglety
hill
him
himself
hinge
hippopotamus
his
hit
hitch
hitting
hoe
hog
hold
hole
hollow
home
honest
honey
hood
hook
hop (n & v)
hope
hopping
horn
hornet
horse
horse-back
horse-shoe
hose
hot
hotel
house
how
howl
howled
hug (n & v)
hump
hungry
hunt
hunted
hunter
hunting
hurl
hurrah
hurry
hurrying
hurt

I

ice
ice-cold
ice-cream
ice-man
icicle
idea
icy
if
in

inches
indeed
indian
ink
indoors
into
insect
inside
instead
iron (n & v)
ironing
ironing-board
is
it
itches
itself

J

jab
jabber (n & v)
jabberer
jacket
Jack Frost
jack-knife
jam
jammed
Japanese
jail
jaw
jelly
jerk
jingle
jingle-bells
jog
joke
judge
jug
juice
juicy
jump
jumped
jumping
junco
just

K

keep
ker-chug
kettle
key
key-ring
key-chain
kick
kicking
kid
kid-gloves
kids
kill
kind
kings
kindergarten
kindergarten-chair
kite
kitchen
kitty
kittens
kiss (n & v)
knee
knew
knife
knit
knock
knocked
knot
know
knuckle

L

lad
ladder
lady
laid
lake
lamb
lamp
lamp-post
land
landed
lantern
lap, n
lard
large
larger
largest
last
lasted
lasso
latch
latches
late
later
laugh
laughed
laughing
laundry
laundry-man
lawn
lawn-mower
lay
lazy
leaf
leak
leaked
leaking
leather
learn
leave
leaves (v)
led
left
left-handed
leg
leggings
lemon
lemonade
let
letter
lettuce
library
lick
licked
lie
light (n & v & adv.)
lighter
lightning
like (v & a)
lily
limb
line
lion
lip
little
listen
listening
live
living
load (n & v)
loaf
lobster
lock
locket
lonesome
long
longer
longest
look
looked
looking
lose
lost
lot
lot (land)
loud
love (n & v)
loved
loving
low
lower
lump
lumber
lunch

M

ma'am
machine
mad
made

magpie
magazine
mail
mail-man
mail-box
main
main-street
make
making
man
many
ma ma
map
maple
maple-syrup
mar
marring
married
marble
march (n & v)
mark (n & v)
mat
matter
mattress
match
match-box
may
maybe
me
meadow
meadow-lark
meal
mean
meant
measles
meat
meat-grinder
medicine
meet
meeting
melt
men
mend
merry
merry-go-round
met
miaou
mice
middle
might
mile
milk
milks
milk-bottle
milk-house
milk-man
milk-wagon
mill
miller
mind
mince-pie
mine
minute
minute-man
mittens
miss
Miss
missis
mist
mistake
mister
misty
mocking
mix
mixed
moccasin
mock
mocking
moist
molasses
money
monkey
monster
monstrous
moo
moon
moose
mop (n & v)
mopping
more
morning
mosquito
moss
most
mother
motor
motor-man
mouldy
mountain
mouth
mouthful
mouse
mouse-trap
move
moving
movement
mow
mowing
much
mud
muddy
mud-puddle
mud-turtle
mule
muscle
music
musket
must
my
myself

N

nail (n & v)
naked
name
named
nap
napkin
napkin-ring
narrow
naughty
near
nearer
nearly
neck
need
needle
negro
neither
nest
never
new
news-paper
next
nibbled
nice
nicest
nickle
nigger
night
night-dress
night-gown
no
nobody
noise
none
nonsense
noon
normal
normal school
north
nose
nostril
not
nothing
now
nowhere
nuisance
number
nut

O

oat
oat-field
oat-meal

ocean
of
off
oh
oil
oil-can
old
on
once
onion
only
open
orange (color)
orange (fruit)
organ
other
ouch
ought
our
out
outdoors
outside
oven
over
overalls
on
own
owl
ox
oyster

P

pace
pack (n & v)
packing
package
page
pail
pain
paint
paint-brush
pair
pajamas
pan
pantry
pansy
pants
papa
paper
pare
parrot
parsnip
partridge
party
pass
passed
paste (n & v)
passenger
passenger-car
past
pat
patch
path
patter
paws
pay
pea
peach
peak
peal
pealed
peanut
peanut-butter
pear
peas
peek-a-boo
peck
peel
peep
peg
pen
pencil
pendulum
penny
people
pepper
perceive
perfectly
perhaps
pettyjohn
phoebe (a)
piano
pick
picked
pickle
picnic
picture
pie
piece
pie-man
pie-plant
pig
pigeon
pile (n & v)
pillow
pinch
ping-pong
pink
pipe
pistol
pitcher
pitchfork
place
plant
planted
plate
play (a & v)
played
plaything
please
plough
plug
plymouth-rock
poach
porch
poem
point
pointed (a & v)
possum
poison
poke
pole
policeman
polite
pond
pony
pony-cart
poor
pop
pop-corn
pop-gun
porridge
possess
postal-card
post-office
potato
potato-masher
pound (n & v)
pour
prance
prancer
practice
preacher
president
presume
pretty
price
prick
pricked
prickers
prince
print
printing
prisoner
prunes
pshaw
pudding
puff
pull
pulled
pullet
pump (n & v)
pumped
pumpkin

punch
punched
punching
punish
pup
puppy
purr
purring
push (n & v)
pusher
pussy
pussy-willow
put
putting
putty

Q

quack
quarrel
quarreling
queen
queer
quick
quicker
quickly
quiet
quit
quite

R

rabbit
race
race-horse
rack
racket
radish
raft
rag
rag-man
rail
rail-road
rain
rain-drops
raining
rainy
raise
rake
raking
ram-rod
ran
rascal
raspberry
rattle
rattle-snake
raw
reach
read
ready
real
reception
red
redbreast
register
reindeer
remember
rest
revolver
rhubarb
rib
ribbon
rice
rich
ride (n & v)
rifle
rig
right
ring (n & v)
ripe
ripples
rise
river
road
roar
roaring
rob
robbing
robin
robin-red-breast
rock
rocking
rocking-chair
rogue
roll
roof
room
roost
rooster
root
rope
rose
rotten
rough
round
row
rub
rubbed
rubber
rubber-boots
rubbers
rubbing
rug
run
run down
running
rusty

S

saddle
safety-pin
said
sail (n & v)
sailor
salt
salt-cellar
salt shaker
same
sandals
sand
sand-man
sandwich
sang
sap
sap-bucket
sat
sauce
saucer
savages
save
saw
sawmill
say
scabbard
scald
scalded
scalp
scare
scared
scalding
school
school-bell
school-room
school-house
scissors
scratch
screen
screw
screw-driver
scribble
scrub
sea
sea-weed
seal
search
second
see
seed
seem
seen
sell
sent
set
sew
sewing
shade

shadow
shake
sharp
sharpen
shall
shame
shark
shave
she
shear
shears
sheep
shell
shepherd
shelves
sheet
shield
shine
shiny
shingles
ship
shipwreck
shirt
shock
shoe
shoe-string
shore
shoot
shot
shot-gun
shove
shovel
show
shower
shut
sick
side
side-walk
sift
sill
silly
simple
simply
since
sing
singing
sink (n & v)
sister
sit
sir
skate
skating
skim
skin
skip
skipping
skirt
sky
sky-rocket
slam
slap
sleep
sleeping
sleepy
sleeve
slept
slice
slide
slim
sling
sling-shot
slip
slipped
slippers
slop
slow
smell
smash
small
smile
smoke
smoking
smoky
smooth
smoothed
smoother
smoothest
snail
snake
snap
snare
snatch
snow
snow-ball
sneeze
sneezing
so
soak
soap
soap-dish
socks
soft
soften
soldier
some
somebody
something
sometimes
somewhere
somersault
son
song
soon
sore
sorry
sound
soundly
soup
sour
south
spade
spank
spanked
sparrow
spear (n & v)
speck
specked
spider
spill
spilled
splash
splashed
splendid
spin
spit
spoon
spoonful
spool
spot
spotted
sport
spring
square
squaw
squeal
squirrel
squirm
squirt
squirt-gun
stab
stable
stack
stair
stand (n & v)
standing
stamp
stamps
stake
star
start
started
statute
stay
stayed
steady (a & v)
steam
steam-boat
steam-shovel
steep
steeper
steer
step
stepped
stepping

stick
sticks
sticky
still
stir
stirring
stirrup
stitch
stocking
stocking-cap
stomach
stomach-ache
stole
stone
stood
stoop
stooped
stop
store
stork
storm
stormy
story
stout
stove
struck
straddle
straight
straighten
strap
straw
strawberry
street
street-car
stretch
stretched
stretcher
strike
string
string (v)
strip
stripe
strong
stronger
strongest
struck
stub
stubbed
stuck
student
study (n & v)
studying
stuff (n & v)
stuffed
stuffing (n & v)
stumble
stumbling
stump
such
suck
sugar
suit
suit-case
summer
sun
sunny
sunk
sunshine
supper
suppose
supporter
sure
surely
surprise
surprised
surrender
swallow
sweat
sweater
sweet
sweeter
sweetest
sweep
swim
swimmer
swing (n & v)
swinging
swift
swifter
swiftest
switch
switching
sword
syringe

T

table
table-cloth
tail
take
taken
talk
talking
tall
taller
tallest
tank
taste (n & v)
tasting
tea
teacher
tea-kettle
tea-spoon
team
tear (n & v)
tease
teeth
teddy-bear
telegraph-pole
telephone (n & v)
tells
telling
tennis
tennis-ball
tennis-court
tent
terrible
than
thank
that
thaw
the
them
then
there
thermometer
these
they
thills
thing
thin
think
thinking
thinner
this
those
thought
thousand
thread
throat
through
thumb
thunder
tickle
tie
tiger
tight
time
tin
tin-cup
tip
tip-toe
tipped
tired
to
toad
toboggan
to-day
toe
toe-nail
together
toilet
told
to-morrow

tomahawk
tomato
tongue
to-night
tonsils
too
tool
took
toot-toot
tooth
tooth-brush
tooth-paste
tooth-pick
top
topple
torn
tore
toss
touch
tough
tow
towel
tower
town
towards
toy
track
train
trade
trap
tray
tree
trick
tried
trigger
trim
trimmed
trip
trolley
trot
trucks
trumpet
trunk
try
trying
tub
tube
tug
tumble
tumbled
tunnel
turn
turned
turnover
turkey
turpentine
twice
typewriter

U

umbrella
unbuckle
unbutton
uncle
under
understand
unfasten
underneath
underwear
unfastening
undress
unlock
unload
unroll
until
union-suit
university
up
upset
up-stairs
upon
upper
us
use
used
usually

V

velvet
vest
very
villain
vine
vinegar
violet
visit (n & v)
visiting
voice

W

wad
waddle
wade
wag
wagon
waist
wake
waked-up
walk (n & v)
walking
walked
wall
want
wanted
war
warrior
warm
was
wash
washing
wash-woman
wash-cloth
waste
watch (n & v)
watched
water
water-wheel
waved
way
we
weak
wear
weave
web
weed
week
weigh
welcome
well (n & adv.)
went
were
wet (v & a)
whack
whale
what
wheat
wheel
wheel-barrow
when
where
which
while
whip (n & v)
whisper
whistle
white
who
whoa
whole
why
wide
wider
wigwam
wild
wild-cat
will
willow
wind
wind-mill
window
window-sill
wing
wink
winter

wipe
wire
wire-pinchers
wish
wishing
witch
with
woke
wolf
woman
wonder
wondering
wood
wood-pecker
wood-chuck
woolen
woolen-mill
word
work (n & v)
world
worm
worn
worst
worth
would
wound (n & v)
wounded
wreck
wrecked
wren
wrist
write
wriggle
wrinkle
wrinkle (v)
wrong
wrote
written

Y

yard
yawn
yawning
year
yeast
yell
yellow
yes
yesterday
yet
you
your
yourself

Z

zebra
zipping

Words Between Four and Six.

A

accident
accidental
according
acre
acting (n)
actor
adder-tongue
address
airship
aluminum
American
ambulance
anchor
angel
anger
angle
angry
ankle
annoy
anything
anvil
apart
appetite
apple-blossom
arch
argue
astonished
ashes
ash-pile
awfully
audience
auger

B

backward
baggage
baggage-car
balance
bandage
bargain
barefooted
basement
bashful
battering-ram
bear (v)
beast
beef-steak
bedding
being
bellows
belly
bend
bent
bet (v)
birch (a & n)
birch-bark
biscuit
bite (n)
bit (n)
bittern
bison
blame (n & v)
blank
bleed
blossom
blouse
blue-heron
boat-house
bolt
boss
bow (v)
boy-scout
brads
brains
brake
brave
braver
bravest
bridle
brim
British (n & a)
broth
brow
bundle
bureau
burnt
burst
buried
bury

C

cabbage
calendar
camel
canal
canvas
capitol
captive
capture
carnation
cartoon
catalogue
cat-bird
cavalry
cavern
cement
cemetery
center

certain
chalk
challenge
champion
cheap
chess
chess-men
chicory
chrysalis
chimpanzee
chopped
chorus
cinnamon
circle
clamp
cleat
click
clinch
close (v)
closely
closing
clown
clumsy
coach
coaster
coax
cocoa
cocoa-nut
cod-fish
coke
colander
collect
colt
college
collision
comet
comical
commode
compare
compass
complain
complaining
completely
comrades
concentric
concert
cone
connect
conqueror
contradict
coddle
contrary
copper
copy
coral
cork-screw
corn-starch
coronation
corset
corset-cover
costume
cottage
country
course (n)
cow-slip
cracked (v & a)
cradle
crank (n & v)
cram
crashing
crate
cray-fish
crayon
crest
crew
crockery
crocodile
crook
crooked
cross-bow
crossed (adj.)
crossed (v)
crush
cube
cuddle
cuff
current
curving

D

dab
dabble
daffodils
daisy
dam (n)
dam (v)
damage
dance
dangerous
dangle
darken
darkness
daub
dead
deaf
decent
decently
decide
decided
deck
decorate
decoration
deer
defend
defeat
delicious
deliver
demijohn
den
depends
depot
derrick
describe
dessert
destroy
destroying
detective
dew
diamond
dictate
dictionary
digestion
dime
dipper
disappear
dissect
distance
ditch
dive
diver
divide
divided
dodge
dodged
draw
door-mat
door-way
dome
double (adj. & v)
double-quick
dragon
dragon-fly
drank
drawer
dread
dried (adj. & v)
drip
dripping
drunk
drum-major
dry
duchess
dulling
dumb
dumb-bell
dwarf

E

eagle
earl
earn
ear-rings
eaves
eave-trough

echo
edge
elevator
elder-berry
electric-flatiron
embroidery
emperor
encore
entirely
English
enjoy
enjoying
equator
erase
eraser
escalloped
especially
evening
exactly
examine
except
excepting
excursion
excuse (v & n)
execute
executed
exercise
expect
expecting
explodes
exploding
extraordinary

F

factory
faint (a & v)
fainted
fairly
farce
farm
farmer
fasten
fought
favor
feast
fern
fielder
fierce
figures
file (n & v)
finally
finish
fire-escapes
fire-works
fit (n & v)
fitting
five-cent-piece
flag
flag-pole
flash (n & v)
flicker (n & v)
flip
flop
flow
flown
flattened
fluffy
flute
fooled
forest
forgive
forgot
fountain
forth
frame
freight (n & v)
freight-car
freight-house
freight-train
friend
fringe
froth
frozen
funeral
fumes
furniture
fuss

G

game
gaiters
garbage
gargle
garment
garret
gathers
gathering
geese
general
gentle
geography
giant
giggle
gipsey
glance (n & v)
glasses (eye)
glasses (marbles)
glimpse
globe
glove
glue
God
going
gold-fish
gotten
governor
gourd
grade
graduate
grand
grand-father
grand-son
grasshopper
gravel
grape-fruit
greek
Greeks
gridiron
grind
grosbeak
grown
grinding
grumpy
guarantee

H

habit
hail
hail-stones
halt
halter
handcuff
handling
hardware
hare
harm
harp
hate
hawk
hedgehog
heir
helm
helmet
hencoop
heron
hidden
high-school
hippodrome
hilt
hire
history
hive
hoof
hoop
horse-car
horse-power
horse-radish
horrid
hospital
hour
hound
house-keeper
hum
humming-bird

husband
hustle
hydrant

I

ice-cream-soda
ice-house
ice-boat
imagine
impolite
imprison
insect
instance
instead
instrument
interesting
interrupt
interrupted
indian-chief
indian-saddle
infantry
injury
island
ivory

J

jackanapes
janitor
Japan
jar
jealous
jewel
job
joint
joist
journey
jingle
jury

K

kangaroo
katydid
keel
keg
kernel
kerosene
killed
kimona
kindle
kissed
knapsack
kneel-down
knight
knob

L

lace
lame
landscape
lance
language
lap (v)
late
lath
lather
lash
laziness
lead (v & n)
leader
lean
leap
lecture
lend
lessons
level
light-house
lilac
linen
link
litter (n & v)
livery-barn
log
looking-glass
looser
lovely
lucky
lullaby
lung
lying

M

macaroni
machinery
magic
magic-lantern
magnet
magnificent
mahogany
manage
mantel
maple-cream
market
marmalade
mash
mask
mason
massacre
mast
mate
measure
megaphone
melted
member
mention
mermaid
message
messenger
Methodist
microscope
mighty
miner
minister
minnow
mischief
mischievous
mit
mole
monument
moose
motor-cycle
muff
muffin
muffled
mumps
murder
muscle
mussel
museum
mustard
muzzle

N

narrow
nasturtium
native
navy
neat
necktie
necklace
necessary
neighbor
nervous
net
nickel
nigger-toe
nod (n & v)
nook
north-east
north-west
notch
note
notice
nourishment
numbers
nurse
nut-cracker
nutmeg

O

oak (a & n)
oar
oak-tree
obey
officer
oil-cloth
older
old-fashioned

olives
opera
opera-house
orchard
order
ordinary
oriole
ostrich
ostrich-feather
ostrich-egg
outlook
overtake
owner
oxygen

P

pacer
pad
padded
paddle
pailful
painter
palace
pane
panther
parade
paragraph
parasol
parents
pardon
parlor
park
parsley
partly
pasteboard
pasture
pattern
pave
pavement
peacock
pearl
pebble
peddle
pedal
peddler
pell-mell
peppermint
perch
perfume
perform
performer
person
perspiration
petticoat
phonograph
photograph
pie-crust
pig-tail
pilot
pilgrims
pimple
pin-cushion
pincers
pinks
pine-apple
pirate
piston
pitch
pitcher
plague
plagueing
plane
plaid
plain
plainly
plaster
platform
play (n)
playful
pleasant
ploughed
plunge
poet
poison
poker
polar
polish
pollywog
poor
porcupine
position
possibly
potato-bug
pouch
pouched
pout
power
powerful
precious
print
probably
probosis
proboses
protect
protector
protected
protection
Presbyterian
press
pretend
prize
promise (n & v)
psychology
pucker
puddle
pulley
pulse
puncture (n & v)
punishment
purple
purplish
purse
puzzle

Q

quail
quart
quarter
question
quiver
quilt
quoit

R

racket
ragged
rainbow
raisin
rap (n & v)
rapidly
rat
rather
razor
reader (book)
really
reaper
reason
recess
red-hot
refused
refrigerator
regiment
regular
reins
remind
reminded
replace
represent
represented
restaurant
retreat
rhinoceros
rhyme
rid
riddle
right-handed
rinse
rip
rising
roast (n & v)
robber
robe
rocket
rod
roller
roller-skates
rompers

roundish
round-about
rudder
rude
ruffle
rumple
rule
ruler
rumbling
rummage
runners
runners (sled)
runaway
rust

S

saber
sack
safe
safety
safety-pin
sag
sake
salad
salty
salmon
sardines
sash
sassafras
satchel
satisfy
satisfied
satisfactory
scalding
scamp
scallops
scamper
scarf
scheme
scrambled
scold
scoop
scorched
score
scout
Scotch
Scotch-man
scrap
scowl (n & v)
scramble
scream
screamed
screaming
screw (v)
scribbling
scythe
seam
seat
second
secret
self
send
senses
sentinel
separate (a & v)
separator
Sepoys
serenade
sermon
serpent
servant
sewer
shabby
shaving
shawl
shaggy
sharper
sheath
shed
shelter
sherbet
sherbet-glasses
shingle
shiver
shoot (exclamation)
short
shoulder
shrink
sieve
sifter
sight
signal
silk-worm
silver
simple
singer
single
size
skunk
slant
slanting
slate
slaves
slick
sleeper
sleet
slip-knot
slender
slung
smart
smoke-pipe
smoke-stack
smoothly
smudge
snuffle
snag
snug
smuggle
sod
south-east
south-west
spare
sparkling
spat
speckled
spectacles
speech
spinach
spine
spinal-cord
spinning-wheel
split
splinter
spoke
sponge
spout
sprain
spread
sprinkle
sprinkling
sprout
spurted
spy
squash
squawk
squeeze
squint
stack (v)
stage
starch
station
starved
steam-shovel
steal
stem
stiff
sting
strainer
stream
strength
streak
strip
stroll
stupid
sturgeon
stumped
struggled
students
stumbled
sudden
suddenly
sufficient
sun-burned
supposing

surround
swallow (n)
swan
swarm
swat
swear
sweetheart
swell

T

tablet
tack
tackle
tackling
tailor
talker
tan
tangle
tape-measure
tapioca
tar
tardy
target
tarts
tassel
taught
telephone-wire
telescope
tend
tended
tempt
tender
ten-cent-piece
thick
thirsty
thistle
thorn
thrash
thrashing
threw
throw
thrush
thunder-storm
tick
ticket
tidy
tidied
tighten
timber
tingle
tiny
tire
tissue-paper
tit-tat-toe
tobacco
toddle
toll
tone
tongs
tortoise
travel
treasures
tribe
tries
trifle
trillium
trimmings
trolley-car
trouble
trout
trowel
true
truth
tulip
tune
turnip
turtle
twig
twinkle
twine
twins
twitching

U

ugly
umpire
uncouple
underground
undone
uniform
unwind
uphill
upset
urge
useful

V

vaccination
valentine
valley
varnish
vase
vaseline
vegetables
vein
verse
vessel
victory
victorious
violin
vote
voyage

W

wabble
wade
wafer
waiter
walrus
wampum
wand
warts
washboard
watchman
watercolors
watermelon
water-spout
wax
weak
web
web-footed
wedding
whenever
wherever
whetstone
whichever
whew
whine
whiskers
whirlpool
whirlwind
whoever
whooping-cough
wick
wicked
widest
wife
wild-goose
wool
wonderful
wormy
worry
worse
wrap
wrapping
wreath
wrecking
wren
wrestle
wrestler
wrestling

Y

yarn
yard-stick
yolk
yoke
young
younger
youngest

Z

zero
zinc

Summary

a. Total number of words used at four years		2,346
Nouns	1,207	
Verbs	679	
Adjectives	268	
Adverbs	107	
Pronouns	33	
Prepositions	24	
Interjections	19	
Conjunctions and Articles	9	
b. Total number of words acquired between four and six		1,134
Nouns	693	
Verbs	270	
Adjectives	132	
Adverbs	30	
Pronouns	3	
Prepositions	2	
Interjections	2	
Conjunctions	2	
c. Total number of words at six years		3,950
Words at four years	2,346	
Words between four and six	1,134	
Proper nouns	370	
Numerals	100	

No attempt has been made to secure a complete list of proper nouns used prior to and at six. The "370" in the above table represents only those names his parents could recall with certainty that S. had used. It is therefore undoubtedly incomplete. In classifying the words under the different parts of speech it was discovered that at least twenty-five words were used by S. in two or more ways. Words such as yet, while, either, each, etc., have been placed under only one part of speech. The compilers feel certain that counting everything S.'s vocabulary at six was something over four thousand words.

NOTES ON SCHOOL-LIFE HYGIENE*

By George V. N. Dearborn,
Professor of Physiology, Tufts Medical and Dental Schools.

The suggestion that most people do not realize the shortcomings of the present school-system needs to be kept constantly in mind. The entire public-school system of the world is defective in many respects, pedagogical, physiological, and medical. For one thing, the child is hurried into school at too early an age. Children should be kept out of the school room altogether until eight years old (see below): Their greater efficiency thereby secured will easily enable them to make up the three lost years and much more of fundamental importance. The school hours and days are too long. The work is too extensive and not intensive enough. The instruction rendered is often defective; only about 10 per cent of the teachers are graduates of normal schools, which means that the instruction is given by amateurs, not by professional teachers. Why trust our children to amateurs? The instruction is given along the lines of tradition rather than in the light of science,—psychology and pedagogy. The pure natural interest of the child is not seized upon as a key to his psychophysical development as much as it should be. So much as a preface.

The particular hygienic points to be considered and kept in mind in these remarks are these: (1), The child must have abundant sleep; (2) abundant outdoor air; (3) much less fatigue than is now usual; (4) abundant and proper food; (5) abundant outdoor exercise and play; (6) entire freedom from care and worry; (7) information regarding sexual matters, and this early in life.

1. *Sleep.* From the point of view of many medical men neither children nor adults get enough natural sleep. The use of tea, tobacco, coffee, cocoa, etc., late in the afternoon, puts off the natural sleep-time an hour or more at least. Watch "Tabby" and "Towser" and see how they sleep and exercise—theirs is a good model of hygienic life in its physiologic aspects. In the early grades children should have eleven hours of sleep daily; and if they take proper, coarse,

*Remarks made (March, 1913,) to *The Parents' and Teachers' Association,* of Belmont, Massachusetts.

outdoor exercise they will get it, because sleepy at bed-time. In the grammar schools and afterwards ten hours of actual sleep should be the minimum. In the latter half of the high school there should be at least nine hours; say from nine until six, or from ten until seven. Another thing to remember is that when the child is passing through adolescence as much sleep is demanded as in the case of younger children. At the age of puberty the child is under a strain not present at any other time of life; necessarily this demands much sleep. The use of tea and coffee should be forbidden entirely, and the drinking and eating of cocoa and chocolate (they contain alkaloids too) should be vigorously discouraged towards evening, for they are distinctly stimulative and tend to keep children awake or make the sleep they do get light and partly unproductive of its proper recuperating effects. The normal child does best without stimulant of any kind whatever, habitually.

2. *Air.* There should be abundance of natural (outdoor) air indoors as well as out. During waking hours the child should be outdoors practically all the time. Sewell in his suggestive paper in a recent medical journal has given us a study of the effects of outdoor air on the human body—such as the friction of the wind, the moisture in the atmosphere, and the like. The skin is just as much an organ as the liver, the kidney or the arms and legs. One of its minor functions is respiration. In it are found six or eight kinds of sense organs of much importance. The moisture and the temperature of the moving pristine air have an effect which stagnant, artificially warmed and moistened air has mostly failed to give.

Technical educators, hygienists, physical educators, physiologists, and psychologists have strangely enough as yet failed to come together and approve the only ventilation-method known that is satisfactory to our modern ideas about mental work, freedom from fatigue, and tuberculosis—all three (and others) at once. The plan* is so extremely simple, hygienic, and natural, so inexpensive and common-sensible that it "seems too good to be true" in a complex and extravagant world. The notion is: *Open the windows.* This formula is indeed simple and the materials all at hand in every indoor school-room in the world: Systematically and continually open the windows for five minutes or so every half-hour whatever be the weather, and require the children to practice during that time whatever physical exercises may be best adapted

* See for a concise statement of this plan and its relations G. V. N. Dearborn: "Certain Physiologic Aspects of School Hygiene," *Education,* xxxi, 1, September, 1910, 34-43.

to the temperature outside and to the pupils' ages. This practice, of course, in principle is in vogue in many schools (e. g., those of New York City, in part), but nowhere as yet on the efficient scale, with the system, or with the beneficial effects here proposed. The present intent is to suggest its vigorous performance as a routine and important part of the regimen throughout every school-day in the year, as a part of the pupil's training in the several important respects concerned, and with the same enthusiasm and intelligence and originality of adaptation that the really good teacher affords her pupils in other respects.

Mental fatigue would be practically abolished; brain and muscles would derive all the benefits peculiar to frequent vaso-motor rearrangement; abundant real ventilation would be at last secured with natural, moving, living, outdoor air, vital with the essential qualities of the unharmed atmosphere; money enough would be saved in school-building construction to replace the amateur teachers with professionals; eye-strain and general kinesthesia-strain (seen as " the fidgets ") would be avoided; children would become somewhat hardened to sudden changes of temperature and humidity; the toilet-rooms might be visited without disturbance of class-exercises; the pupils would get abundant muscular exercise taken under the least fatiguing conditions; the teachers would keep fresh and at their maximum efficiency. These nine are, perhaps, the most obvious of the benefits related to this plan. The only valid objection (that some children would take cold in very harsh weather in a cold climate) may be readily overcome by an intelligent adaptation of the method or by the segregation of the over-susceptible pupils until their mucous membranes became trained to ordinary outdoor conditions.

No child should sleep, of course, without two windows open every night—no matter what the outdoor circumstances.

This second point, then, is simply this: School-children must have abundant outdoor air indoors and out,—natural moving outdoor air, as nearly as possible under outdoor conditions.

3. *Fatigue.* The third notion is that there should be *less fatigue:* Every research emphasizes very strongly that the conclusion is correct that our school-children are often overfatigued. Certain books because popular give the wrong point of approach entirely. Such books for example as "Little Men" and "Little Women" by their very titles alone have done a lot of harm, for they are large sellers and are found in every public library. They totally misrepresent the nature of the child, for the child is *not* a little man nor a little

woman. The child is different in almost every essential respect from men and women; different not only in mere quantity but in inherent quality.

The essential element of childhood which demands to be constantly kept in mind is undevelopment, immaturity, not merely as to stature and weight and strength, but as to tissue, as to every tissue-cell of the body. This is especially true and important of the nerve-cells: the neurons have not yet developed to their full size and strength. Therefore is it in part that the young child is incapable of training in the mental sense. It is quite impossible to physically train a child as a man may be trained to do things until he is 16 to 18 years old—largely because the muscle and other cells making up his body are not yet fully developed, but also because he lacks some of the chemical substances (hormones) necessary for the development of various parts of his body, a lack, of course, not apparent to observation, but now beginning to be understood. It is chiefly owing to this undeveloped condition of the billions of cells making up the child's body that the whole child fatigues so easily; and the teacher has always overestimated the strength of the child. The injuries of over-fatigue are cumulative; just as are the injuries from the continuous use of alcohol. A man can go on taking a drink or two of whiskey for months, and in some cases years, and not know that any injury has resulted; and then awake some morning, so to say, to find himself permanently disabled: his heart-action crippled, or his nerve-centers permanently diseased. So it distinctly is with fatigue. The child may run along with a small amount of over-fatigue each day for years and no result be apparent, perhaps, except in times of special stress and strain. Later on in life, however, in misfortune in some depressing illness, such as typhoid or pneumonia, in which the grown child needs a little surplus of nervous energy, he finds that he has not only no surplus to draw upon, but shows every sign of having a deficit of nerve-strength compared with the normal person. He has been working along below the standard of efficiency which would have been possible to him but for the over-fatigue of childhood which had prevented the proper development of the nerve-centers and cells. In all the different researches made in America, Europe, and Japan as to the effect of fatigue, the results were convincing. In school-work the fatigue always was measurable and considerable and the results cannot be doubted: namely, that our present school system is unduly fatiguing.

The practical point of the whole matter for immediate remedy is that study out of school before the age of fifteen

is entirely wrong from the physiological point of view. It is one of the defects of our school-system that children are allowed to study at their homes before that age. After about that time there is no reason why they should not do so to some extent. But if a school-system cannot teach a child what is necessary to be taught during five or six hours of the school day, there is something wrong about it. The fact that it is allowed betrays the general ignorance of childhood's nature in the first place, and the common lack of intensive efficiency in our school system in the seond place. Prof. Berle of Tufts College has recently demonstrated the possibilities of intensive home-training, as his important little book relates. He shows how a child can be taught important things more intensively, that is, without spending so much misused time and routine effort. The Sidis system, so-called, and the Montessori system are directed along this same line—many such streams showing that we are spending too much time about our school system and not pushing hard enough in the thoughtful way meanwhile. School is, I repeat, for emphasis, too extensive and not sufficiently intensive. The quality of the study and not its quantity is the one important thing. The object of the school should be to teach the children how to think and become efficient and self-reliant and not merely how to accumulate more or less miscellaneous facts. Interested attention certainly affects the mind more usefully than any other mental means. It is the focus-power of the mind at its best. The child often acquires a great deal more mental efficiency from what he gets without knowing he is getting it, so to say, than he gets by the active, extensive study of books. And much of this more important part of the childhood education he will get outside of school if he has the right seeds of interest put into his mind during school hours.

Aside from all extraneous matters (expediency, convenience, etc.), it would undoubtedly be to the great advantage of the average child's ultimate welfare if he went to school for the first time during his ninth year. It remains for some genius-pedagogue to reconcile the diverse interests; meanwhile the actual child is not getting the best out of his developmental youth. The great chorus of parental voices asks, *What* shall we do with our children before the age of eight, if they should not be allowed to go to school till then? This matter of school-age, then, is distinctly and emphatically a matter of expediency: a matter of practical expediency and not of theoretical desirability. The average parent wants to get rid of the young child for a few hours each day, and the teacher is willing to help. This is not a theoretical condition at all. The

theoretical aspiration is to let the child run loose on a farm until eight or nine years old. Then one sees how rapidly he makes up by his greater efficiency in the acquisition of knowledge,—for he has a sound nervous system! As to children in the cities, strike a "happy medium" and have them go to school after the sixth year or seventh. There is always a golden mean. The "social life of the school" to the child under eight is not of sufficient advantage to offset the loss of nerve-building outdoor life.

On the Montessori-Berle plan the average child will learn to read and write long before eight years old if surrounded with people of average intelligence who are at all interested in him. My discussion is purely theoretical, as physiologist and psychologist, and as such my opinion is in the direction that the child much more than makes up mentally what schooling he has lost by beginning at eight or nine, and so far as his body is concerned he has obviously the great advantage, and mind and body are one. That is the ideal condition and may not always be practicable,—until the great light comes! Of course it would depend partly on what was done at school. Much outdoor work in gardens and nature-work and manual training would be distinctly in the right direction and in the nature of a compromise, looking toward the advantages of the ideal outdoor-life plan.

The broad general principles of the Montessori method is going to do great things and modify our school system. When applied in a large, rational outdoor way, the way we Americans believe in, it will assuredly have a good deal of influence on our American school system, for it contains some of the important essentials of the most advanced psychophysiology on which the pedagogy of the future must rest. We should take especial interest in this system because much of its "material" was devised by Edward Seguin and used in the education of the feeble-minded here in Massachusetts many years ago, as a brief visit to the sense-education department of the State School will promptly demonstrate. Since then Doctor Fernald has greatly developed this important system of education, and Maria Montessori has given it wide publicity.

Another thing that should be noticed by parents as well as teachers is the use of vacations. They should be absolute holidays. The essence of a holiday (Saleeby) is freedom from care. Yet some teachers take especial, almost fiendish, delight in giving out a lesson for a vacation to be ready at the beginning of the next unpleasant entertainment she has to offer. This is more than an unkindness to any child, for it not only

spoils the lesson but impairs the vacation as well. The vacation should be an absolute outdoor holiday whether it be three or four months or one day in length. The essential of it should be freedom from care. Mixing study and play spoils both.

This whole matter of fatigue is an extremely important one, but the phase of it I wish to drive home and impress is the ever imminent danger of over-fatigue. Because children do not appear fatigued is no sign that they are not so. Because the girl, urged on by youth, does not appear exhausted, is no token that her essential nerve-cells are not seriously fatigued. The child has such an effective surplus of energy that its obvious exhaustion day after day would mean nothing short of lasting physical incapacity. A good healthy, active boy who feels dead tired in a *nervous* way every night is inclined toward an early breakdown. And from abundant knowledge on this subject I assure you that the average school child, and especially the over-conscientious school children, usually girls, are over-fatigued after a few weeks of school. Lessons should not be given out to be done in the evening or over Sunday until the pupil is developed enough to have nerve-cells developed to almost the adult condition of size and vigor.

4. *Food.* The fourth suggestion is that there must be *abundant and proper food.* The only food-principle that replaces worn out tissue is what is known as protein. This is commonly thought to be contained chiefly in meats, but not only meats contain it in an easily available form, for many vegetables, especially peas and beans, contain proteid in large amount. It is especially important that the growing child should have a sufficient amount of protein food, preferably from both fresh meat and vegetables. Furthermore, he should have an abundance of fat, vegetable or animal. These are the main suggestions, short and simple enough, that I have to offer in the dietetic direction. Perhaps the average child, and adult, too, does not eat enough fat. A large amount of this alimentary principle is necessary to proper nourishment and replenishment of the nerve cells of the brain and spinal cord. These get their nourishment from a substance (chromatin) which is partly protein and partly fat, a body of the class called lipoids.

No one, hardly, ever knew of a grouchy fat man; it is a matter almost proverbial that all fat people are good natured. And in that good nature there is not only something pleasant to meet with and have in the family, but it is one of the very most important things underlying plenty of ease in acquiring knowledge, in learning. You do only with a great waste of energy what you do not enjoy doing.

So long as the child is growing in stature, then, he should have an abundance of protein and of fat. Carbohydrates should likewise be in quantity: these are the sugars and starches. The essential muscles cannot work without sugar. They live chiefly on sugar. The child requires sugar just as certainly as sunlight and fresh air. The only exception to the use of sugar by children is eating between meals. If the boy or girl has a well developed outdoor appetite, derived from gross muscular exercise, a slice of bread and butter will taste just as good as cake or pastry or anything else that is sweet. The great armies of the world are now furnished candy as a matter of the ordinary ration. (Queen Victoria a year or two before she died sent half a pound of sweet chocolate to every British soldier in South Africa, and the boxes you will find scattered all over the world today in the homes of Britons treasured like a family heirloom.) Candy of various kinds is served in quantities to every army as part of its regular ration. This is because they have to do a large amount of muscular-work in walking, etc., all of which demands sugar to provide the energy as well as protein to restore the worn-out tissue.

School-children should drink a large amount of water, a much larger amount than the average child is inclined to take without impulsion. The regular practice of this habit supplies water to flush out and keep cleaner the digestive tract and tends to keep the kidneys and the skin in good condition. It is an advantage to drink a large amount of water with the meals, as well as between meals, with one important proviso: The child is apt to take a big mouthful of food and then wash it down with a big mouthful of water without the formality of mastication. Guard against this one bad habit and see that there is thorough mastication of the food, and I can assure you on general authority that a considerable amount of water with the meals is an advantage in every way. It makes the food more enjoyed and is "to the good" in other ways. They used to think that the stomach was a closed bag secreting a certain amount of gastric juice and that therefore if you drank water it would promptly mix with it and so dilute it that indigestion would result. To-day we know in the first place that ultimate digestion is rather more intestinal than gastric, and moreover that if you drink a pint of water, in a very few minutes it will be in the intestines and in another short interval in the blood itself. It does not come into much contact with the gastric juice or the secluded glands secreting it. Therefore have the children drink more water at and between meals!

Amount of food: There is less need to speak of that in a well-to-do community, certainly not the need there is in parts of all large cities. No child should ever have less than 70 calories per kilogram of his body-weight: that is the technical dietetic standard for growing children. (Infants below school age should have at least 90 calories.) Today you can readily figure out the fuel-value of foods in terms of the common measures,—an ordinary glass of milk is worth so many calories, a usual portion of butter so much, etc., etc. A little care would enable any parent or teacher to estimate the food-value of all the nutrients the child eats. But no one but an ultra-scientific parent would do it; and I would not want them to, simply because it is usually unnecessary.

School children should eat an abundance of easily digestible food rather often. Children should eat on some other plan than the boa-constrictor method. (The boa-constrictor, it is said, eats one meal every six months and then sleeps more or less until the next meal-time.) They should always have breakfast. In the great cities it is a rather common experience to see school-children who have had nothing substantial: the child will eat a banana or something that "fills," but which as fuel is worth only a few calories, practically valueless as physiological food. You should give the pupil a good substantial breakfast, including something that is "warming." Aside from poverty and parental ignorance it is, even among children, in some cases, quite a fad to go without breakfast altogether; the simple truth of this matter is that the people who adhere to this eat their breakfast the night before. The child, of course, should have the biggest meal in the middle of the day, that is, assuming that you have only one session of school and that the child has come home about 1 o'clock for the rest of the day. Of course it is true that for some time after a hearty meal free intellectual work is impossible, and so this advice would not apply where there is an afternoon session. But if possible, the school-child should have dinner when he comes home from school and not at night, especially when children are left free to eat then some things they should not be permitted to eat. It does not put a child in the best condition to sleep if the heavy meal is at night; on the other hand muscular exercise afterwards does not interfere with digestion. To my mind the ideal school-session would extend from 8:30 to 12:30 or from 9:00 to 1:00, with a recess of an half-hour, or even three-quarters, midway. Fatigue would then be minimized, dinner at the right time, and the afternoon be free for the indispensable exercise and play out of doors until supper-time.

Coffee, tea, chocolate, and cocoa I have already referred to. There is no notion that cocoa at breakfast will hurt any child, but at lunch it is apt to keep him from sleep and should never be used in any considerable strength within three or four hours of bed-time.

5. *Exercise.* The next hygienic point to be suggested in this more or less fortuitous series is *a great amount of muscular exercise.* An abundance outdoors is needed. The kind of exercise the child needs is *gross* exercise,—exercise which requires no mental strain, no nerve-strain, and which employs the gross muscles. Walking and running, climbing, etc., are the ideal forms of exercise; for they use two or three times the amount of muscle-tissue that any other kind of exercise uses. Unless the child be mentally overworked, the inherent and all-important impulse to activity will insure this indispensable adequacy of outdoor exercise. If the child is healthy and normal, instinct will see to it that he gets plenty of gross muscular exercise up to the age of eighteen or twenty, if he has the chance, spatial and temporal.

One thing of which it is no use to talk, but which should be forever remembered is *country-life.* Country-life is the only physiologic child's life. The cry of "back to the farm," "close to nature," "next to the ground," or any other of the numerous similarly slangy expressions which mean so very much for the good of the child and the future generations, should not be lightly dismissed. Those children brought up in places where there is plenty of room and abundant outdoor time are extremely fortunate. This is one of the greatest problems of the future. The trolleys, telephone, electricity, moving-pictures, libraries, parcel-post are beginning to solve that great problem. They and other things are rapidly making country-life more and more attractive, and before you know it the abandoned farms will all be gone and then who knows but what there will be tenements to let in the cities' crowded districts!

6. *Freedom from care and worry.* Childhood is the carefree period of life. None the less a good many conscientious children do worry in school-time, although they do not make it so manifest as the old-maid aunt or the over-worked, dependent father. They worry about their lessons and all sorts of things related thereto. Education should *not* worry them. If their education is to be of any use, it should be in the main attractive and absolutely without any possible element of worry. You cannot expect the child to sleep well, for example, who has worry on his mind.* The education of the

*See the present writer's recent "Nerve-Waste," Booklet, No. 27, in the series published by the Health-Education League, Boston.

mind, as well as that of the body, as the physiologist sees it, should be an attractive process, free of all worry. The chief objection to attractive education, as some think of it, is that it lessens the vigor of mental training. That is not of necessity at all true. A sufficiently skilled board of teachers could devise an educational system that would be attractive and even somewhat pleasurable to the child and at the same time have in it any amount of desirable mental training and discipline. These two things (attractiveness and training) are not inherently exclusive; the idea that they are so comes from the old notion of the continual use of the rod, and thinks of discipline as mostly dependent on punishment. I maintain that a professionally skilled teacher will make education at once attractive and give it plenty of physical and mental discipline too. The mental training should be included in the attractive education. Recently various writers have emphasized by research the various degrees of efficiency with which people do things when they enjoy or dislike doing it. For example, the well-known research by Professor Book on the acquirement of skill on the typewriter. He convinced himself that on what are called "off-days," when the individual did not enjoy his work or practice, he made no *advance* whatever in learning, he did not *increase* his skill any or improve his speed or his technique or accuracy; there was no advance on those days in which the individual did not "feel like" doing the work. The moral of this important research is not that we must stop routine work when it is not pleasant, but that we must not try to do extremely difficult and new things when we do not enjoy it. Artists of all kinds discovered that many years ago. No artist thinks of composing on a novel, or a piece of music, or doing original work on a painting or statue when he is feeling out of sorts and does not really wish to do it. He will go away for a month or a year and then come home and, for example, paint a picture in a week which he can sell for more than one a drudge could paint in six months.

It remains for the school-system to adopt this important method of the artist, or to rediscover it anew and apply to the high purpose of education. Education should be made more attractive. You should not expect children to carry on with true success this extremely complicated process of learning something unless the work be presented in such a way as to be pleasant to them. That which is pleasant is usually interesting,—and *vice versa*. You may take a boy to school and "punish" him and so make him study after a fashion, but it is at a great *extravagance* of nerve-strength. Joy is the birth-right of every child; and moreover the child's efficiency

is greatly increased by letting him be joyous. Happiness, like honesty, is the best policy as well as the best experience in general that we can get out of life. It is not only "the greatest thing in the world," but it is the best "business," for it gives you the greatest index of efficiency that is possible.*

An element of this matter too often ignored by parents as well as teachers, is encouragement. Certainly children do not get enough encouragement from their parents, and commonly none from their teachers. The parents may leave it to the teacher and the teacher leaves it to the parent—with the inevitable result that the child does not get encouragement at all. Specific encouragement as to the details of his work is needed by every child.

7. *Sexual enlightenment.* It is more than high time that this subject *were* in the air, as it is to some extent today. There is great need for sane enlightenment on sexual matters; that is, knowledge of the theory of love in the minds of growing (as of adult) people. The average parent still believes that sexual ideas and feelings and curiosity do not develop much until puberty. That is not true. We now realize (Freud) that the child usually gets curious about sexual matters when he or she is from eight to ten years of age, if not earlier. This is purely intellectual curiosity and not much based on physiological conditions. It is purely ideal or intellectual curiosity, curiosity to know where babies come from, just as there is curiosity to know what is on the other side of the moon or why the rain comes. This sort of curiosity can be and should be satisfied when it appears, and by the parents.

The important psychological reason why the child should be gratified in this is because satisfaction drives the curiosity out of the mind. Explain to an active boy how a machine works and he will be more apt to stop thinking about it—his impulsive curiosity is gone, but unless you do satisfy this sexual curiosity early, it *remains* and works subconsciously and may work to the child's disadvantage. This is sound psychophysiology. These perfectly natural and inevitable ideas arising about the age of ten, or even years earlier in an inquiring mind, are clearly and purely scientific and when explained will tend to disappear until the time of puberty. Then they become instinctive and you cannot and do not wish to make them disappear, and the enlightenment then must be in an adult fashion and in a more complete way. Before puberty there is nothing of necessity especially interesting

*This whole matter is discussed in G. V. N. Dearborn: "The Sthenic Index in Education," *Pedagogical Seminary*, xix, 2, June 1912, pp. 166-185.

about sexual matters until they grow into the overwhelming sexual instinct. Schools of eugenics are being started. A pioneer school has just been started in Boston by Doctor Evangeline W. Young, and bids fair to become a valuable institution, for it is a school where teachers and parents and social workers can be enlightened on all the scientific phases of sexual matters. And there are plenty of things yet to be worked out. The details are rather difficult, but no one is going to admit that so tremendous and important a matter cannot be solved to the solid and lasting satisfaction of all concerned, born and unborn. The so-called social evil is one of the tremendous crimes and scandals of civilization, and this "great enlightenment" is in my opinion the only practical way to hold it in check: actual definite knowledge on the part of every one, just as every one knows the ill effects of alcohol and of the excessive use of tobacco or other drugs.

There is a real need to call attention to these educational dangers arising everywhere chiefly because the average teacher and the average parent do not realize that the nature of the child is different from that of the adult. Our children are not indeed young men and little women, far from it: they are different in every way and it is time that all persons concerned realize this truly important fact.

The science of child-physiology strangely enough, has not yet been born, while that of child-psychology is still in its early infancy. When these two sciences have developed somewhat into a real competency and have been adequately applied to education, we shall see a tremendous benefit not only in the efficiency of our schools as a working machine, but in the happiness and usefulness of their product:—the contented and prosperous *family,* knowing well, parents and children both, how to prosper. Our children are decreasing in number largely on the plea that the few will have a better chance,—is it not time now seriously to consider, all of us together (parents, teachers, and scientists), why this better chance is not coming to them in larger measure? For the children are everything.

MOOD IN MONOLOGUE

By Thomas P. Bailey, Ph. D.

Although little is now heard in a popular way about that "child study" which was so much in vogue some years ago, the scientific study of the mind has received a stimulus and an impress from child-study that it will, let us hope, never lose. Psychogenetic studies and the psychogenetic point of view are well established facts in contemporary psychology. When the greatly to be desired practical science of character, John Stuart Mill's "ethology," shall take on vigorous and productive life, we shall probably find that child-study, chastened and scientific, will prove to be its most important source of material. And by no means the least important phase of the study of children will be a microscopically careful investigation of typical or concrete-generic bits of naïve childish life just as and just when they normally occur. Sometimes it happens, especially in matters of human nature, that a combined "coarse-adjustment" and "fine-adjustment" study of a single typical case will prove more suggestive than an attempt at a more pretentious inductive treatment of large masses of material drawn from divers sources and hence put out of that personal human setting so important in "embryological" study of character.

The following little sketch has at least the merit of presenting the material substantially as it occurred, and its "story" was recorded within fifteen minutes of the event. Moreover, the recorder, realising the importance of photographic accuracy, conned his lesson as it proceeded so as to give as nearly as possible the child's *ipsissima verba,* paragraphing and expressive signs. Trivial as such an exercise of alternating attention may seem to the uninitiated, no man who has undertaken to make a moving-picture show of his mind, to keep track of the story being exhibited, to watch the apparatus, the audience and himself,—I say that no man who has tried that kind of thing will be ignorant of what "strained (and trained?) attention" means!

I

The father of the family is enjoying his pipe and the cool of the evening after supper, and his mind reverts to a psychological theme that had held his attention a few hours before. The four-year-old girl, B. L. N., quietly slips out to the

veranda from the supper-table; takes her seat on her father's knee, without asking leave, and nestles close against him. Her eyes are wide open as she gazes alertly into the thick foliage dimly lighted by the pale moonshine that filters through thin clouds. She begins to prattle in a low tone, but at first the father pays little attention and strives to continue his psychologising. After a while his attention is caught by the rhythmic swing of her speech and the regularly repeated formula of her conditional sentences. Her *ifs* seem to be expressive of imaginary anticipations. It has been said that "the impulse to poetry is the instinct to express mood." "This child is certainly expressing a mood," says the father to himself, and is coming as near to spontaneous poetry as she can with her prosaic little brain. So with her brook-song of prattle the little one makes her elder stand still, like the wedding-guest in the "Ancient Mariner," and listen to her tale.

"Papa, if a mad-dog came at me you could kill it—wiv (with) your gun—couldn't you? (Mh-hm). Papa, a mad-dog can't climb a tsee (tree), can it? It's too slicky, isn't it? If a mad-dog comes at me I can jump on it and it can't hurt me, can it? (Faint demur.) Papa it wouldn't hurt a little baby, would it?

Papa, if a rabbit came at me and I would lie down, it wouldn't hurt me, would it? It wouldn't hurt a baby, would it?

Papa, I dreamed about a big-fat calf that came at me on the concrete sidewalk, but I and Claudia took James' hand and wan-away and it couldn't hurt me. It couldn't hurt a big-fat boy like you, could it? (The "big-fat boy" is forty-two years old, is over six feet high and weighs less than a hundred and thirty-five pounds!)

Papa, if bad fings came at me the angels wouldn't let 'em hurt me, would they? *God* wouldn't let them. *He* sees.

Papa, if a big-fat lion came at me, you wouldn't let it hurt your baby, would you?—Papa, we used to call you *father;* but we don't now, do we? (The grown-ups used to coax her to say "fader.") I was a little baby once and had all I wanted to eat—milk—and all I wanted to eat. But I'm a *big* girl *now.*

Papa, bad fings can't hurt a big girl, can they? A mad-dog can't hurt a big girl, can it?

Papa, once a mad-dog tried to get me and I went up a tsee (tree).....'"—Here follows a dramatic recital, fabricated out of hand, at the end of which an interruption occurred.

II

A few notes may make the child's stream of talk more significant. The "mad-dog" is a symbol of danger traditional with the child's brothers and sister. Moreover, very frequently stray dogs pass close to the house and usually elicit some exclamation of the "get out of here" order from some member of the family. Hence the child probably expects to see a dog. If so, only the "mad-dog" will suit time, place and mood. B. L. N. has climbed trees and found them to be "slicky" at times, especially when she has her shoes on. The thought of jumping on the dog is like unto the old Esopian fable of *"Hoedus stans in tecto domûs lupo praeterunti maledicit."* When her father shows disapproval of this suggestion, she takes refuge in the concept of her defenceless babyhood that ought to be safe from all untoward occurrences.

The second figure of what is probably a slight mood of fear, is the rabbit, who probably takes color from the enhanced personality of Uncle Remus's astute hero. The rabbit *might* hurt, but won't.

The "big-fat" calf is an idealisation of a dream-calf previously characterised simply as calf, whose prototype was probably little and lean. Of course we ought all to make our dreams interesting and dramatic!

Starting with a real dog of partly mythical attributes, she proceeds to a literary rabbit, and then to a dreamland calf. Here is ample material for "supposin'"! At this stage she gets closer to the land of fears, and bolsters up her confidence in her near-by protector by her unconsciously sardonic remark about the "big-fat boy." Of course that calf was only one of the many "bad fings" that come in dreams. And, equally, of course, all well regulated households of children know that angels are the natural and supernatural foes of "bad fings," and that "God" is the chief of the angels, perhaps the "biggest-fattest" of them all! But, as her nine-year-old brother would say, "God won't mind her calling Him that, will He, Papa?" Now be it known unto all men that know children: the lion is one of the chiefs of "bad-fings." In lieu of more spiritual aid, Papa will have to serve as a more or less tangible substitute for more effective help. Perhaps her references to her father may be connected with the thought of God as Father, a piece of teaching recently given her at Sunday School.

The pathetic reference to the baby whose diet was so strictly limited in quality but so gloriously unlimited in quantity may be due to the daily necessity of restraining the young hopeful's over-specialization in the devouring of whole-

wheat and graham biscuits. Indeed, she had just left the table, minus one more biscuit that would have been one too much!

At this stage the little psychoanalyst sits up. The fear-attitude is slowing down; the confidence and protection attitude is rising. And the "big girl" comes on the stage with the recital of an imaginary encounter with a rather spiritless "mad-dog" that can't even climb a "slick tsee."

III

In venturing upon a few psychological comments I am considerably helped by a rather intimate knowledge of the child's character, so far as it has revealed itself. But every psychologist interprets phenomena of the mind from the point of view of his own system. Therefore I have tried to keep the comment as free as possible from interference with the facts themselves. And yet I am strongly inclined to think that the little story and others like it will bear out some of the suggestions that follow.

(1). Here we have a mood that develops from a slightly excited fearsome imagination to one of protection-safety and, finally, make-belief. There is a succession of fear-inspiring images, not taken too seriously, and with salvation from the objects of fear never lost sight of but becoming more assured as the little monologue comes to an end.

(2) The associations strike one as auto-suggestions, eventuating in a sort of catharsis of the vague fear that underlies the mood. Indeed, the child plucks out her scarcely rooted little sorrows, facing the dim scene of ill-understood nature, but from the vantage ground of a father's protecting arms. Her talk is not soliloquy but monologue; for the sense of her father's presence is constant and guides the self-catharsis to a successful issue. I believe that not a few hints about psychoanalysis might be got from the instinctive psychotherapy of childhood. Even the religionists who are practicing mental healing might well get some guidance by studying children's exhibitions of faith and love. Many an adult might copy this child's method of talking herself out of a fear. And, if I am not mistaken, the best psychotherapists try to induce in their patients the habit of self-cleansing from emotional besettings.

(3.) Note the range of the child's associated *experience:* memory images, hearsay, literature, dream, teaching, present reality (nestling in her father's arms), make-believe. The discourse runs from the mood as a centre into all possible lines of association. It sometimes seems to me that the only real consistency and unity in thinking is the product of some

affective mood, which may be due to some primitive emotion, at one extreme, or to what I have called elsewhere the "conceptual coenaesthesis," at the other. For mere logical thinking has but a pseudo-consistency compared with the vital unity of a deeply based mood that affects the whole character. The cold, dry light of reason is, after all, the product of a specialized faculty, not of an integrated character. But in order to show forth unity, a mood must be characteristic, like the little child's that we have studied, not pathological. She has no absurd fixed idea and the fear of it—no fear of her fear,—but a confident and limpid self-expression in the presence of a normal social environment in which she knows and feels that she belongs.

(4). *Association* by *congruity* (similarity) is seen in the list of beings that are imaged more or less clearly. The class "bad fings" is divided into mad-dogs, big-fat calves, etc. The class of good things includes brother and father as well as God and the angels. There is mood congruity and relational congruity as well as mere association. Her *continuity* associations are manifested by her use of personal experience, dreams, reference to her babyhood, stories heard, "big girl," etc. Association by *community* is shown not only by her conference with "Papa," but also by her tendency to draw him into touch with her experiences. And these modes of association are three-in-one, not three. For in any typical sentence all three aspects are to be seen, forming a synthetic unity that is far from being merely mechanical.

(5). Such episodes as "We called you father," "When I was a little baby," etc., testify to some degree of self-conscious reminiscence. She chuckled a little when telling of the time when the children called "Papa" *father*. The chuckle can't be written out, but it was meditative. Here again we find the vitality of a genuine normal mood, rather than a lot of mechanical associations more or less interrupted by emotional explosions. We may come some day to a better psychological realisation of what it means to be "like unto a little child."

(6). Practically all the most useful and usual relations and categories of everyday thought are to be found in the little monologue: For instance; space, time, number, part and whole, cause and effect, means and end, reference, significance, control. We could get along pretty well in the mental life with these nine categories only.

(7). The child's philosophy might be summed up in these simple judgments: Bad things are threatening, but can be stopped or mollified; little girls are protected; big people need no protection; when children get big they are no longer afraid

of bad things. Doubtless more than this is involved in the philosophy of the mood, but I think that at least this much is implied.

(8). A child's thought may be far more complex and perfect than many take it to be. The first study of a child that the present writer ever made tempted him to agree with certain philosophers and psychologists that a child's failure to use the pronoun *I* at an early stage of his speech-development indicates his lack of self-consciousness. Well, when the second child (a brother of the first) was studied, care was taken to address him always as "you." And the grown folk usually remembered to say *I* rather than *Papa, Mamma,* and the like, when speaking of themselves. Interesting enough, this second child said *I* from the start. If he possesses more self-consciousness or had an earlier development than his brother, no one could detect it. On the contrary, the elder boy is by far more self-conscious, in any sense of the term.

We have already noted the fact that our little subject's thought is organised relationally, is unitarily characteristic and not merely mechanical. Curiously enough, in a previous study* will be found a study of association series of two adults, the parents of B. L. N. The earlier study shows that the adults' associations are very largely mechanical and accidental, whereas the child's we now find to be vitally well organized. The adults' mental processes are lazy and conventional; the child here does all the talking but keeps her head against her father's heart, metaphorically as well as actually. And yet, psychologists keep on drawing their illustrations of mental processes too largely from the experience of adults. True, we run the risk of misinterpretation when we try to analyse a child's thought. But of course we run that risk in the interpretation of our own mental processes. Besides, I am not asking that we cease to introspect—such a procedure would make child-study of no use—but that we should take children's conduct, when it is expressive and naïve as an objective guide to reality in conjunction with our own careful introspection. It is easy to poke fun at "baby-psychology," but a much harder thing to appreciate its value and to take the time and patience and sympathy necessary to get anything worth while out of it.

(9). Finally, attention may be called to the kind of mental stuff that hangs together in this little story of the mind. In a previous study* I tried to illustrate what kinds of mental phases "went together," and gave the following as what

* Journal of Phil. Psy. and Sci. Methods, Vol. 3, pp. 435-9.
* Jour. of Philosophy, iv., pp. 342ff.

might be called the *affective grouping:* organic sensation, coenesthetic feeling, imagination, pursuit, anticipation. I believe that the present study of a mood is a capital illustration of a feeling-phase. The child's wriggles at certain climaxes of her story can be inferentially called expressions of *organic thrills.* She assuredly was a little *excited. Anticipation* is shown by the whole context and the structure of the "supposin'" or *if* sentences. *Pursuit* is shown in the headlong haste and close trailing of the main mood, and in such vigorous expressions as "climbed a tree," "jump on him," "kill it," and the like. I should say that a typical affective mood ought to include all the just mentioned phases as affective renderings of "intellect, feeling and will," with the pleasure-pain-excitement phase of feeling predominant and coloring the whole mood.

THE CHILDREN AND RELIGION

By John J. Marrinan, Pinkerton Academy, Derry, N. H.

I

Dr. Faunce has said, "The men who sit at the head of the pew on Sunday morning are probably beyond the period when great changes are possible. Why should they wish to remodel a life,—if it were possible for them to do so—remodel a life which the world has honored, or reconstruct a society which has given them wealth, position, influence? They can be strengthened in good resolves already made; they can be comforted in trouble, but their religious education is at an end; their successful career has been the finishing school." There is a wealth of good pedagogy in the foregoing, a pedagogy which repudiates the "never too late to mend" philosophy, and further points the channel through which religious education must proceed if it is to rise above formalism and find its expression in the deeds of men.

In Dr. H. K. Carroll's annual statement of church statistics we learn that the gains in church membership during the year 1912 show a loss of almost one-third in net increase of members as compared with the previous year 1911, and this, notwithstanding the fact that the church has but recently invested over a million dollars and considerable energy in the Men and Religion Movement. The great significance of this fact seems to lie in its testimony of the soundness of that opinion which declares: "We must recruit our Christian army from the ranks of more or less neglected little children. Let us prepare them for the service by offering them the advantages of a pedagogical religious instruction."

Of all civilized nations the United States has but the single ally, France, in the policy of "laissez faire," which this nation in its official capacity feels compelled to manifest toward all matters of religious education. In fact, Protestant, Romanist, and Jewish brothers in this country all unite to support the proposition that the American democracy cannot logically sanction any organic bond between church and state, even though such relationship exist for the sole purpose of guiding a broad scheme of unprejudiced religious education. Here, as in other fields of human endeavor, the results of the cen-

turies of factional and denominational warfare cannot be obliterated in a day. Yet the duty of rearing our young people in surroundings brilliant with the light of the Christ-life, this obligation remains uncancelled in the family, in the community, in the nation. The performance of this duty gives a great promise for the future efficiency of the American Christian Church.

But what criticism can be directed against present-day religious instruction? Why is it that so many of our young people are unhappy or indifferent attendants in the Sunday School? Why does the secular school letter outbid the Sabbath School badge on the playground? Why is the American boy charged with lack of reverence? Why is a clergyman of my acquaintance obliged to use device and pleadings to secure a response in Christian Endeavor service, a response tinged with diffidence and entirely wanting in spontaneity? Why do many of our fellows deem it sufficient to worship at the altar of formalism one day each week? Why are the leaders of a powerful church, seeking Christian morality, complacent in their reliance upon the deterring influence of the appeal to human fears? We must look to a decadent religious pedagogy in answering these questions, a pedagogy born of dogma and of arrogant authority, a pedagogy which has known the man and "the little man," but not the boy.

Perhaps never before in American life has there been so urgent a need for strong educational leadership in the church as there is today, a leadership competent to guide young people safely amid the pitfalls of an environment seething with economic, social, political, even religious unrest. The clergyman of the near future must shoulder this responsibility of Christian educational leadership. Our cleric brother must, like Christ, be a teacher; not a teacher of dogma, doctrine, or of the profundities of theology, as much as a teacher of living Christian precepts; not a sensationalist, not a materialist, but an educational leader who, by word and deed, shall bring his people to a living contact with the highest and best in human life.

What more interesting and fruitful work can there be for a pastor than that which he will find in the great field of religious education? And what a boon it will be to the church, and to the community, to have as spiritual guide a man versed in the training of children, a man who will assemble parents perhaps for a consideration of child hygiene, a leader who will call a sound pedagogy to the task of rekindling the fire of religious life in the home, a minister who not only inspires men to seek the spiritual life, but one who can contribute to the en-

richment of the lives of children. Such a clergyman will not place great dependence upon device, revival, conversion. His work will be essentially formative—not reformative. He will proceed with that unwavering certainty of the master builder, and, above the foundation of a completely lived, christian childhood, will raise a structure of vigorous christian manhood.

II

The tendency of the present day seems to be toward a high degree of specialization in all departments of human activity. It would appear that the home of today attends chiefly to providing the material comforts of life, and shifts all educational burdens upon the recognized special educational agencies, the schools. The same tendency manifests itself in the gradual disappearance of that active religious life of the home, which was such a potent influence for good sixty years ago. Indeed the Sunday School of the twentieth century has been generally designated as an educational specialist, and must soon announce the inception of a more efficient religious pedagogy.

However, in recent years American religious education has taken many steps forward. The ascent of psychology and religious pedagogy in the seminary promises much. Then the Sabbath School has been relieved in some measure of the perfunctory methods of the past, graded lessons introduced, expert supervision sought, and teachers trained. The general plan of operations has been to adapt the guiding principles of secular education to use in the Sunday School.

But the church must not rest with merely such progress. The religious school, by virtue of its place of distinctive independence, its freedom from the slow-moving and frequently complicated machinery of public instruction, has an opportunity to eclipse the secular institution. It must avoid the errors into which our public schools have fallen; it must attain a level in the world of education which shall be in keeping with the importance of its work. Finally there must be the leadership of a sound pedagogy, making its appeal to human life as we find it in this 20th Century.

Let us turn for the moment to a consideration of the problems to be solved in elevating religious instruction to the level of greater efficiency. Numerous questions suggest themselves. Will the modern Sabbath School be provided with the physical accompaniments which have been proven indispensable to the secular institution? Could there be curricula for religious instruction which would present a natural seqence of biblical

subject matter? Is it possible to solve in the near future that disturbing problem of securing additional time for instruction,—perhaps by the arrangement of a mid-week afternoon session? Shall we retain the attractive, fair-haired and blue-eyed good fellow of the neighborhood as teacher, or must he give way to the young man of strong personality, trained for the work? Should there be manual training in religious education? Is the present graded lesson system successful? Shall we have pastoral supervision? How can we make the normal training class a successful unit in every organized religious school?

Such a plan of activities as is suggested by the preceding queries will place a heavy initial expense upon our churches. Furthermore, it calls for a superior ministry, and, doubtless, an educational campaign of this magnitude cannot be thrust upon our congregations in a day. Nevertheless, it will eventually solve the problem of irreverent children, indifferent church support, and empty pews.

Let us consider briefly the guiding principles which must direct religious education. The philosophy of "first the blade, then the ear, then the full corn in the ear," should be a fundamental in both secular and religious education. Twentieth century pedagogy appropriates this significant principle in its declaration that education should not be considered as preparatory to life, but rather should be esteemed as an expression of life itself. The teacher is to help unfold completely a measure of child-life today, thus providing a basis for a full measure of the higher adult life on a future day. The boy of ten is not to be given a pared-down morsel of adult teaching, for he is but a "blade," and is not yet ripe for the harvesting activities of the "full corn in the ear."

A growing consciousness of the importance of this work of religious education, not alone to the church, but to the community, and to the nation, has led many investigators into the field. It has been noted that a large percentage of boys are lost to the church during the years of early adolescence. The conclusion has been drawn that this period between twelve and sixteen years of age is the critical period in the religious education of the boy. As a consequence, much attention has been given to the choice of biblical materials, and to methods of instruction adapted to the needs of the adolescent.

However, is it not possible that a more comprehensive pedagogy will find it desirable to supplement this excellent work by devoting some considerable attention to the roots of the tree of religious life, those roots which are nourished or im-

poverished according to the measure of pedagogical intelligence employed by parent or teacher during the periods of babyhood and early childhood?

Infancy is the time in the development of the child which demands an instruction rich in romping physical activity and in the exercise of the senses. Here is the foundation upon which all later mental and spiritual attainments are reared. The penalty of disregard is ever that which comes to him who builds his mansion upon the quicksands.

Later, at the age of perhaps six, the old stick personified becomes the prancing steed, and the boy lives in an age of imagery. He imitates, he is curious, and he questions; he talks incessantly, he becomes a nuisance to the unsympathetic parent or teacher. And yet, this is nature's way of laying a ground-work for the proper functioning of a human soul.

Will religious pedagogy take advantage of these divinely implanted impulses which find expression in the spontaneous play-activities of all normal children, and which call forth and direct that vitality which makes possible the growth and development of body, mind and spirit? Will the Sabbath School recognize in these impulses, beacon-lights of God's creation, marking for the teacher, the true channels of normal child activity?

Again can we convince the religious educator that nature deems it necessary that every normal child who comes into the world shall repeat in natural order all the activities which have helped unfold the mind and soul of the race? At three years the boy is a selfish little animal; at nine he lives in a world peopled with heroes; at fourteen he hears the call of the "gang" instinct, and enters upon his social being. Indeed, the boy from birth to manhood is passing through a succession of periods of activity, nascent periods, each period marked by a peculiar responsiveness to characteristic activities, each activity a heritage from the past of the race. Dewey tells us that it is the business of the teacher to seize upon these budding impulses to activity displayed by the child, and to train them until they ripen and pass over into higher endeavors: Activity,—growth, development; Inactivity,—decay, degeneracy.

The kindergarten child learning the geography of Palestine through sand-table work or paper-cutting exercises, the boy of ten years becoming acquainted with Jesus, the hero, the boy of twelve or fourteen associated with his fellow adolescents in the Boy Scout Patrol or in the Agricultural Club,—it is probable that all these are being instructed according to the most approved tenets of present-day educational philosophy.

But the child of eight, seated in the church auditorium, amidst a riot of sense stimuli, and coerced into committing a memory verse, a verse similar perhaps to the following to be found in a Junior Quarterly, "In Him was life, and the life was the light of men," such an unfortunate is sowing—or having sowed for him—the seeds of strong dislike for that which he might be taught to love. This is but another instance of the common practise of administering a dilution of adult philosophy to the "little man."

And yet, a rich fund of appropriate material well adapted to effective teaching is ever available and awaiting but a summons to the work. The teacher of the Bible who has gained even a fair intimacy with the Great Book in its geographical and historical settings, and who appreciates its *use* in religious education, will scorn to take advantage of the deplorable "crutch" possibilities of the Sunday School Lesson Sheet. Such a teacher has at his command a wealth of interesting subject-matter for the babe, the boy, the man, subject-matter which, if rightly presented, will not only swell the stores of human knowledge, but will touch the well-springs of human emotion, and inspire boy and man alike to a participation in the active Christian life.

Let us not be mistaken in the goal of religious instruction. Sometimes it would seem that our teachers deem it sufficient to stock the child with biblical information. Yet have we not seen the precocious Christian of perhaps ten years, adorned with a superficial mask of bible lore, have we not been witness frequently to such a boy's fall at twenty-five into the depths of religious apathy and indifference? The educational institution which is satisfied to measure the efficiency of its work by the "acquirement of information" standard, the religious school whose practise is restricted to formal question and answer methods is contributing little to the life of its children. Indeed, it is under such conditions that "a birth-right is exchanged for a mess of pottage," and souls intended for the activities of noble living are confined to the baser levels of superficiality.

To illustrate, Mr. X. was reared amidst ideals of church attendance and Sunday School honors. The habits of youth were so deeply impressed that today X. attends services faithfully when at home over the week-end. During the six days which really test the depths to which Christianity has reached, Mr. X. is, during play hours, an immoral scoundrel. But in the home community he is still held a model, and as a representative of a leading text-book publishing company he is called successful. His training, as will be noted, has fitted

him very well for work in the rural communities where, almost invariably, a clergyman is the dominating influence of the school-board. Mr. X.'s field records enable him to arrive in town on the evening of the prayer-meeting service. He attends, he testifies, his *information* of church and of churchmen makes him a welcome guest of the pastor after service hour. The inevitable happens; he sells a bill of goods; his religious experience has found its expression. Not then merely a knowledge of the forms, procedure, good usage of the church, not the narrative of the Christ-life as the end in religious instruction, but rather a pedagogical use of these wonderful resources in the development of resolute habits of Christian conduct. There is the goal!

Said the Great Teacher, "Suffer little children to come unto me, and forbid them not, for of such is the kingdom of God. Verily I say unto you, whosoever shall not receive the kingdom of God *as a little child* shall in no wise enter therein." Although suggestive of the unfortunate "better than thou" attitude of warring christians, yet is there not a hint of the pedagogy of Jesus in that boast of an eminent Roman Catholic Bishop, "Give me a boy until he has reached seven years, and you may take him,—if you can." And this Romanist brother is interested in the construction and operation of parochial schools. Again is there not a hint of a high-grade religious pedagogy in 1 Cor. 13:11, which in substance is, "When I was a child I spake as a child, I understood as a child, I thought as a child, But when I became a man I was 'prepared and ready' to lay aside childish things." Indeed it might be said that in these verses we find the pedagogical gist of the whole matter of both secular and religious instruction.

Cleric and lay brothers should unite in urging upon our communities the great need of a more efficient religious instruction of our children. Thorns and thistles will undoubtedly strew the path along which this educational advance must proceed, and, as ever, discouragement will greet him who challenges the fences of tradition, but let the champions of less theology, and more and better pedagogy, be cheered and urged forward to a strong advocacy of this movement, contemplating the enrichment of child-life, by that homely philosophy of a discerning student of human affairs, "We are all headed for the city of the ideal; some of us may never reach it, yet the suburbs are very beautiful."

PSYCHOLOGICAL DIFFERENCES BETWEEN CHILDREN AND ADULTS

By Frank E. Howard, Berea College, Berea, Kentucky

That the boy is not a "little man," or the girl a "little woman" is quite generally acknowledged, but the specific points in which the mental life and habits of children differ from those of adults are not widely understood nor taken into account in educational practice. We need much more investigation of these differences, but very significant ones have already been detected and emphasized, and the disregard of these are responsible for many of our most common pedagogical errors. The consideration of these mental differences and their pedagogical significance is the purpose of this discussion.

Few experimenters have deliberately undertaken a specific comparison of the mental processes in children and adults; some of the differences are brought out incidentally, however, in general investigations of particular mental processes. We must also remember that in the consideration of this subject the term child cannot have a constant meaning. The mental processes of the normally developing child are constantly approaching the adult type, with varying rates of growth, and each stage has its characteristic marks. If we include the period of adolescence this subject can best be stated as "the effect of increasing age on mental processes."

I. Memory and the Learning Process

The mental process which lends itself most readily to objective test is memory, and of course memory, learning process, and ideational type, are so closely connected that they can hardly be treated separately, memory being the first step in the learning process, and both dependent on ideational type.

One of the first to secure experimental data on this subject was Kirkpatrick (17) in a test in word reproduction made upon pupils in a typical school and college, in all grades above the third primary. His table of results shows increase, from the primary department up, in the power of immediate reproduction of words of all kinds, but a difference of only about

two words between primary and college students. Younger pupils required a longer time to write them and very likely let some words drop from their consciousness. College students must also have had better mental grasp. In reproduction after three days the college students showed no superiority over the children. On this third day when told what was wanted the grammar school pupils began to write immediately, while the college students hesitated and apparently made effort to recall the words. "This," says Kirkpatrick, "suggests, and many other facts make it probable, that children are equal or superior to educated adults in impressibility, in retention, and in spontaneous recollection, while the latter have gained more power of voluntary acquisition and recollection. Younger pupils are superior in the memory of spoken words as compared with written."

In a series of experiments on memory types Hawkins (12) obtained results which agree with those of Kirkpatrick. These experiments were made on public school children, students in a commercial school, and juniors and seniors in college. He found that younger pupils in nearly every case reproduced numbers without any hesitation, while the college students always hesitated and required more time. "It would seem to indicate," says Hawkins, "that pure spontaneous memory depends on the degree of impressibility, while a cultured intellect depends more on the power of reason. Young children are superior to adults in impressibility, in the power of retaining memory images and in spontaneous recollection while the latter have gained more power of voluntary acquisition and recollection."

Hawkins also performed experiments to determine which was stronger, visual or auditory memory in public school children from eight to twelve inclusive. Except in one instance the auditory was higher, and this probably was due to lack of attention on the part of a few pupils. In the same experiment with a class of commercial students ranging from fifteen to twenty years of age 28% reproduced in auditory and 45% in visual terms. Hawkins concludes that auditory memory is superior for children; visual, for adults. He thinks the reason is that children are more accustomed to auditory work while adults employ visual memory more.

We should note here the possibility of transfer from one sense department to another. Auditory stimuli may give visual images and the child may recall through the aroused visual image. On this account it is very difficult to reach any conclusions regarding ideational or memory type through objective tests. It is probable that both the mode of presenta-

tion and the type of ideation are factors in the general result. In this connection it may be well to mention Pöhlman's conclusion (23, p. 184) that auditory presentation is better for significant material (words, phrases, connected discourses, etc.), and visual for nonsense material.

Colvin and Meyers (8, p. 108) offer the following explanation why the younger pupil more readily retains meaningful material when presented in an auditory manner. "It is not because he is of a less pronounced visual type than is the older pupil. Indeed, the results of this and other studies show the reverse to be true. It is rather because auditory presentation is of necessity successive, and visual is generally simultaneous, that the superiority of auditory over visual is shown. The young pupil attends better when he gives successive attention to the material presented in an auditory manner than he does to the visual material over which his eye may move at will and without plan. If he is visual minded the material presented in an auditory manner is quickly (for the most part unconsciously) translated into visual terms and what is lost in this translation is more than compensated for by the more effective attention secured through the successive presentation when the material is read to the pupil. With the nonsense material, however, the visual presentation is a tremendous advantage in the earlier grades over the auditory, and the gain in successive auditory presentation is more than counter-balanced by the loss which the pupil suffers in not being able to form a distinct image of the nonsense syllable."

Netschajeff (22) tested 687 children in St. Petersburg for growth of memory (ages 9-18). Lobsien (19) repeated these in a more extensive way and with somewhat modified methods on 461 children (8-14) in the schools of Kiel. In general the results agree and indicate that the various kinds of memory show great fluctuation in development, most marked at the beginning of puberty. Lobsien found the greatest relative increase between the ages of ten and twelve. Memory of emotional states remains slightly undeveloped until puberty when it begins to grow rapidly. In general, the increase in memory is not the same year by year.

Meumann (21) refers to these and other results, also those obtained by himself and his pupils, and concludes that young children are very realistic in thought and that most are of visual type, while the mental processes of adults are more in terms of general ideas.

Colvin and Myers (8) made also tests on 520 children in Champaign, Illinois, later on 75 students in the University of Illinois, and still later on 200 such students, to discover

the ideational type of the observers, and also the relation between various types of imagery and the learning of material appealing to the three chief sense departments. A part of their results bear directly on our problem. The experiments consisted chiefly of memory tests for both immediate and delayed recall. One series of tests was of nonsense material appealing only to the vision, another series was distinctly auditory. Their curves show concrete visual imagery to be remarkably strong in the earlier years. In the visual tests the third grade had an average of 75% correct results, fourth 74%, fifth 72%, sixth 72%, seventh 65% eighth 62%, high school 75%, university 73%. These results show an actual decline of concrete visual imagery through the grades with a tendency to recall in high school and university. Their explanation of this decline and subsequent recall is as follows: "The chief element in the retention of younger children is the impression represented by the concrete visual image; of the more mature child and the adult, the association. The rapid decline of the concrete image is not compensated for by a corresponding increase of the elements of association until high-school and university are reached. There is, therefore, an actual decline in memory for concrete visual material at about the onset of puberty." This decline is also pointed out by Lobsien and Netschajeff.

Colvin and Myers' curves show a fairly constant increase in verbal-visual imagery (nonsense syllables visually presented). They suggest that in the lower grades it is probable that a large part of the successful results were obtained by the observers holding a concrete visual image of the syllable in mind, while in higher grades the significance of the syllable was an important element of retention. In the upper grades attempts to assign names to the meaningless characters were frequently reported, less often in the grades. In the university it was the general procedure to assign some name to the nonsense character and join nonsense syllables together in some meaningful way. "It seems quite evident from these results," conclude Colvin and Myers, "that the undeveloped mind relies primarily on the impression for retaining its material, while the more mature mind is aided by holding the material through association." One rather surprising result of the Colvin-Myers series of experiments, was that tracing syllables, etc., with the blunt end of the pencil was not an aid to learning in the lower grades. In fact it seemed to be a hindrance until the eighth grade was reached. The motor imagery, if any aid, must have been so slight that it was more than offset by the distraction of the movement.

In the reproduction of a story appealing equally to the three sense departments there was a preponderance of motor recall in the lower grades. This is not, as explained by the authors, out of harmony with the previous results obtained in tracing nonsense syllables, but is doubtless due to the interest of the younger subjects in what was *done* in the story. The motor elements of the story were retained by all three ideational types in the lower grades. "By the time the University is reached the mere matter of interest has become of much less importance and the tendency towards verbal-visual imagery strongly asserts itself."

The following conclusions by Colvin and Myers summarize the results of their experiments in so far as they bear on our problem.

1. The young child thinks largely in concrete visual imagery, and while auditory and motor are present to some degree they play a relatively unimportant part. The child up to ten is predominantly a visualizer.

2. This concrete visual imagery, and probably all concrete imagery, tends to fall off in the more advanced grades, its place being taken by verbal imagery. The rise of the latter is probably due to the increase of the ability to associate and give meaning to memory material. This compensation is the least in the upper grammar grades, hence there seems to be an actual decline in imagery. Its subsequent recovery is due to the growth of power in the adolescent to associate and group into meaningful relations his memory material.

In tests of rote memory, Pöhlmann (23), with various materials and methods of presentation, obtained the data given in the following table:

NET EFFICIENCY OF VARIOUS MEMORIES IN RELATION TO AGE

Age	9	10	11	12	13	14	15	16	17	18	19	20
Average Capacity in %	39.4	41.4	55.7	59.1	62.1	68.9	55.3	62.9	58.6	58.0	65.4	68.3

Pöhlmann thinks that the general evidence is fairly clear that mechanical memory improves up to puberty but fluctuates after that period.

The studies of Shaw (20) and Henderson (13) in the memory of logical ideas show that adults surpass children in learning capacity but not in retentive capacity. According to Shaw's experiments the learning capacity of boys increased

from third to ninth grade from 17% to 42%; girls from 18% to 43%. High-school boys averaged 40%, girls 47%; university students did no better. In later reproductions the experiments of Shaw and Henderson agree that younger subjects have as good retentive capacity as adults. A study of the following table by Henderson will show that it agrees very closely with the results obtained by Pölhmann.

AVERAGE PER CENT OF LOSS IN THIRD REPRODUCTION (4 WEEKS)

Age	Adults	16	15	14	13	12	11	10
Per Cent of Loss	14	8	13	15	14	12	10	10

Hence the logical as well as the rote memory seems best near puberty.

Much light is thrown on our problem by the careful and extensive researches of Meumann (21) and Radossawljewitsch (25. The general results of his experiments, Meumann thinks (21, p. 192 ff), show that the learning ability of children of all the school years of the *Volkschule* is far less than that of the adults tested. The adult of 46 has a greater learning ability than the school children in the best years of their development. The child requires more repetitions and more time to learn the same material. The adult being more accustomed to logical impressions, often has to exert his will power in pure mechanical learning, but as soon as he has practice the results are more favorable than in children in the *Volkschule* and in a certain degree even than in those in the *Mittelschule*. But the child retains what he has learned much longer than the adult, or in other words, forgetting proceeds less slowly. The same relation exists between younger and older children, i. e., the younger require more repetition but retain longer and reproduce after a certain interval more exactly.

Radossawljewitsch (25), who has conducted an extensive series of carefully controlled experiments with reference to differences between adults and children, presents the following summary of his results:

1. The adult requires in general fewer repetitions for learning an exercise than children. The older children require in general fewer repetitions to assimilate material than the younger.

2. The improvement through exercise (*Übungsfortschritt*) is greater in adults than in children.

3. The loss after practice (*Übungverlust*) is less in children than in adults.

4. The retention of adults is greater only in the first two time intervals (5 to 20 minutes), and after all other intervals the children retain more than the adults, and the younger children remember better than the older after the first and second intervals. Here is a very noteworthy characteristic of the childish memory. It assimilates with difficulty, then forgets quickly a certain quantity of the impressed material, but then retains all that survives the first period of forgetting with much greater tenacity than the adult memory.

5. The adult shows greater immediate retention than children, and the older children than the younger. The most intelligent of our children reproduce immediately four syllables and the others three and two. Adults produce up to eight and in a few cases ten and twelve syllables.

6. Recognition (*das Wiedererkennen*) is in general somewhat greater than in adults.

7. Children make in general more errors in repetition than adults. From this we should not conclude that the reproduction of the child is less exact than that of the adult. It is due more to the following: (a) The weakness of the child's will. (b) The weakness of his attention. (c) The difficulty of the nonsense material for the language abilities of the child. (d) The greater uncertainty "*des Gefühls des Auswendigkönnens*" in the child.

8. For the child, reproduction is in general a somewhat slower process than for adults. Formation of association is not so rapid.

9. Children, especially the younger, show greater tendency to rhythm (*Rhythmiserung*) than adults.

10. The persistence of ideas (*Perseverationtendenz der Vorstellung*) is greater than in adults.

11. The attention of the children is noticeably weaker than in adults and the younger the child the weaker the concentration.

12. The children, as the adults, show no pure ideation type.

13. As in adults there is a transfer from one memory type to another. It appears that a predominating visual type transfers to acoustic by continuous learning.

14. Girls show more of the predominating acoustic type, and the boys more of auditory and motor.

15. Children show in almost all time intervals greater absolute and relative saving in repetitions than adults, and the younger the child the greater the saving.

16. Forgetting is in almost all time intervals (except after 5 and 20-minute period) less than in adults.

A very interesting qualitative study of memory has been made by Colgrove (5). This is based on returns of 1,658 correspondents. An analysis of these brings out some significant facts concerning differences in memory due to age. Tabulations are made according to age in periods as following: I, 1-4; II, 5-9; III, 10-11; IV, 12-13; V, 14-15; VI, 16-17; VII, 18-19; VIII, 20-29; IX, 30-39, etc. At puberty there is a marked obliteration of infantile memories. At ten and eleven the motor memory curve begins to decrease in girls and to increase in boys and is nearly culminated for boys at 14 and 15. At 18 and 19 there is a marked and continued increase of visual memories for both sexes, which culminates at 30-39. Memory for activity in others also increases. As we should expect, there is a great widening of the range of memories during adolescence. After 20 there is a marked change in the memory content. Different memories culminate at different periods and bear close relation to the whole mental life of the period. In general, Colgrove's study shows that age is a very important factor in the memory content (hence whole mental content) of both child and adult.

Ideation and Ideational Type

The conclusions drawn by Meumann from the experiments of Ziehen and those by himself and Winteler in Zurich are the most enlightening material thus far presented on this phase of our topic. The tests were made with boys from 7 to 14 years of age. Meumann's conclusions may be summarized somewhat as follows: Children are more superficial in reproduction, i. e., they relate words and ideas more through outward resemblances. They show more of the *"Perseverationtendenz"* of ideas. When a child falls into a certain manner of reproduction he holds to it with great persistency. This occurs more frequently with the younger, and is also characteristic of the more unintelligent child; e. g., one boy was strongly inclined to say "very" with every adjective. Another characteristic of children is that they make fewer verbal associations than adults. Their associations are more of objects and events. Children's ideation is much more concrete. Adult ideation is mostly in silent speech. Among the verbal associations which occur with a child, simple word modifications are favored, e. g., *Post—Post-Karte, Bett—Bettfedern.*

The child thinks more in individual ideas than the adult. Meumann says that in many thousands of reproduction experiments on adults he has found very few reproductions with individual ideation (often only 5 or 6% of the reproduction are of this type). They usually reply to the stimulus word in abstract terms.

The unintelligent children show more abstract reproduction than the intelligent. Hence it is not a good thing for the child to approach the ideation type of the adult prematurely. It seems psychologically and pedagogically well established that the child should remain as long as possible in concrete individual ideation. It thereby acquires a large store of concrete "*Anschauungsvorstellungen*" on which it can later build up its abstractions.

This predominance of the "*Individual-vorstellungen*" decreases gradually with the years and with the progressive development of the child. There is a gradual transition to the adult type. This appears with the thirteenth or fourteenth year, though Meumann says he has found in children of this age strongly predominating "*Individualvorstellungen.*"

Ziehen states that these "*Individual-vorstellungen*" are mostly of a visual nature. According to the experiments of Netschajeff, Lobsein, Winteler, and Pfeiffer, the realistic ideation of children is predominatingly visual.

Meumann discusses the question of the greatest influence in the reproduction of children. Combining his own experiments with those of Ziehen he finds that the school instruction has much influence in reproduction. This is especially true if the stimulus word is rather unfamiliar. Most of the material is furnished by the instruction in natural science, history, and local information (*Heimatkunde*). The next greatest source is the home environment and family life. The private reading of the child also furnishes much material.

According to Ziehen it is not the readiest or most fluent associations that occurs oftenest in the reproduction experiment but those which claim the greatest interest in the life of the child and which have the greatest feeling tone.

The association-reaction time is much greater in children than in adults. The mind of the child works much more slowly than that of the adult. This difference is so astonishing that one is often inclined to doubt the experiment and think that the reaction is not taking a normal course, but one is convinced after a time that these long reaction times are typical of the childish mind.

The quickness of reproduction increases with each year of

the child's life. The older the child the quicker the reaction. The *"Individual-vorstellungen"* require longer time than is required when they are not present, and according to Ziehen longer than the less familiar general ideation (or *Allgemein-vorstellungen*). The richer the ideation the longer the time.

Meumann makes a significant pedagogical suggestion here. He says that formal facility in reproduction can be essentially improved by practice in both children and adults. This is important for the treatment of the question in instruction (*Frageunterrichts*). Now the reaction experiment is in a certain degree an abbreviated question experiment, the spoken stimulus word corresponding to the question. Here it is worthy of notice, that as a rule the shorter the time of reaction the more worthless the reproduction. "I have made," says Meumann, "control experiments with children and adults in which I instructed the subject to react as 'quickly as possible,' and then warned them not to react until the meaning of the word was fully understood. When this latter instruction was given the mental content and value of the reproduction increased significantly." His pedagogical conclusion here is one of vital importance in elementary and to some extent in secondary instruction. The practice of requiring pupils to give quick answers or asking a great many questions during a class period is a very common one in our American school rooms. Now the quick answer represents the first and most worthless answer. We know that children do not take time to get the content of a question clearly before their mind, and rapid fire questioning only encourages loose habits of speaking and thinking.

Attention

Meumann's studies of the child's attention consciousness are enlightening. Unfortunately he holds to the use of the term voluntary and involuntary, or active and passive attention. As Titchener (Text-book, p. 271) and others have pointed out, passive and active attention are only different stages in attentional development and neither have any distinctive features. However, this use of terms need not detract from the value of Meumann's tests or of his well-grounded conclusion.

Meumann observes that the attention of the child tends more towards distribution than towards intensive concentration. Thus with this tendency is associated a decided inconstancy and instability. This, however, is subject to much variation in individuals, and may be greatly decreased through practice. Investigation shows an apparent increase in the

range of attention with growing familiarity with the objects exposed in the experiment, but this is effected not by the attention alone but by the whole perceptive process. Of the most simple elements (points, lines, etc.) presented simultaneously the six-year-old child perceives clearly two to three, the twelve-year-old three to four, the fourteen-year old on an average, five, and the adult four to six.

By range or span of attention is meant the number of impressions that can be attended to without decreasing the clearness which each one would possess if attended to alone. Meumann insists on the difference between range of consciousness (all elements perceived at once) and attention (all clearly perceived). In children the increase in the number of elements in the field has a more unfavorable effect on the attention than in the adult. The effect of apperception in the child is in general more arbitrary, subjective, and unreliable.

Tests of attention to successive stimuli are concerned not only with the range of the attention for single elements, but also with the recognition of groups—phenomena much the same as the above. Meumann found that the span of attention for six to seven-year-old children was four to five simple sounds, for eleven to twelve-year-old children five to six, and for fourteen-year-olds, six to eight. In general, (1) the effect of practice on the span of attention seems as slight in the child as in the adult, (2) younger children tend more to let their attention be diffused and broken up. Though they may get ideas of more numerous stimuli these ideas are more inexact than in the adult. The child's span of consciousness is relatively large, but his span of attention is relatively small. (3) Fluctuating attention is the general type till the eleventh or twelfth years. (4) Attention of children is more sensory than intellectual. (5) Attention is adapted to new activity much more slowly than in the adult. (6) Constantly repeated stimuli are necessary to hold the child's attention for any length of time, *i. e.*, the attention is typically dynamic. (7) There is more of the motor or physical accompaniments of attention in a child, this is a marked characteristic up to the twelfth or thirteenth year.

We may note concerning the general mental faculties (1) that up to the sixth or seventh year the faculty of practice is apparently less than in the adult—due to lack of endurance in attention. (2) In general the child is mentally and physically much more easily fatigued than the adult but provided with the faculty of rapid recovery.

The common basis for the fluctuation and lack of endurance

in childish attention is the greater instability and inconstancy of the organic processes which are sympathetically connected with all mental processes.

Suggestion and Imagination

The extensive use of "*Aussage*" tests have clearly demonstrated the excessive suggestibility of the child mind. There are of course great individual variations among both children and adults, but there is perhaps no greater factor of difference between the adult and child type of mind than the difference in the tendency to be affected by suggestions. The age of maximum suggestibility has not been determined, but it is plain that there is marked decrease at puberty.

The suggestibility (warmth) experiment by Guidi (11) indicates that nine is the age of maximum sensibility, but Okabe at Cornell found no characteristic differences between the grammar grade boys and adults. The experiment by Small on the "Suggestibility of Children," though not performed on adults, shows a decreasing percentage with advancing age. His tests for illusion of perfume made on pupils from grade three through the high-school gives the following percentages of those who thought they smelled the perfume: I, 98%; II, 95%; III, 83%; IV, 63%; V, 50%; VI, 27%; VII, 13%; VIII, 0%; High-school, 0%. In grades I, II, and III when asked by the teacher if they were sure they were not mistaken, the pupils said "sure." In grade II immediately after the first a second spray was used and the pupils asked if they noticed any difference. Several at once said it was "a good deal stronger."

Experiments on illusion of sight were made on 381 pupils in grades I, II, III, IV, V, VII; 291 saw movement where there was none; 90 saw no motion. Per cents of illusions for the grades I to VI respectively are 96%, 81%, 80%, 70%, 34%, and 71%. Grade VI brought the per cent down. The room was well lighted and the experiment was performed immediately after recess.

The regular and rather large decrease of suggestibility as shown in these tests—what we would expect, and doubtless if these tests were tried on adults the per cent would be much lower.

What is known as the ink-blot experiment has been performed by a number of experimenters with interesting results. Each child is presented with a piece of paper on which there is a large and irregular blot of ink and asked to tell what he sees there. Kirkpatrick (18) obtained the following results:

AVERAGE NUMBER OF NAMES GIVEN TO INK-BLOTS (KIRKPATRICK)

Grade	I	II	III	IV	V	VI	VII	VIII
Average	2.9	2.5	2.6	1.8	1.9	1.7	2.1	2.2

In explanation Kirkpatrick says, "The younger children seemed to have no doubt whatever of the spot being a picture of the object named, while the older children said 'it is some like' or 'it looks like.' The table shows a steady decrease in the number of objects seen until the seventh and eighth grades are reached, where the average is nearly as high as in the two lowest grades. Kirkpatrick thinks this is probably due to fact that the children of the fourth, fifth, and sixth grades have become more critical in their sense perceptions "as they have learned from life's experiences to be more careful in their judgments." On the other hand the older pupils regarded the whole exercise as a work of imagination and had no reserve in stating what was suggested to them by the ink-spots.

Since we really know very little about the imaginative consciousness and experimental data concerning it must be gained chiefly through introspective observation, no definite statement can as yet be made regarding the difference between the child and the adult type of imagination.

REASONING

Miss Ellison (9) has given us an interesting though not extensive study of children's capacity for abstract thought as shown by their ability to define abstract terms. The data consisted of the definitions of twenty-seven words, mostly abstract nouns, as given by 219 boys and 253 girls of ages ranging from eight to fifteen. These words were later given to seventeen students in the psychology classes in Clark University with a view to comparing the definitions of the children with a group of adults. The definitions were graded as to excellence of form after the following scheme:

A. Definition by Sample
1. Definition by phrase or clause.
2. Word to be defined followed by "something" or "anything."
3. Involving mention of person or thing.
4. Definition by examples.
5. By use of adjective.

B. Definition by Abstract Phrase. { 6. When and What, That and If clauses. 7. Use of Infinitive.

C. Definition by Equivalents. { 8. Synonyms. 9. Fair Definitions.

Miss Ellison offers the following helpful conclusions: "Such a mastery of common abstract ideas and of language as would make possible reasonably perfect definitions is nearly or quite wanting in children of thirteen and under, though for several years before that time the abstractions have been clearly enough grasped and the vocabulary has been large enough to allow a good deal of definition by synonyms. Still earlier the children seem to hold the idea in a distinctly concrete fashion and to convey it, when required to do so, by means of concrete examples variously expressed; while the youngest children of all cite examples of the use instead of really giving the meaning of the word, possibly for the reason that at that stage the idea itself cannot be brought clearly before consciousness." Seventeen of the words were given to university students, and in the case of part of the words they were asked to note introspectively anything of importance to be observed in the framing of the definition.

The chief thing shown by these introspections is the large mass of associations which the words called up. The definitions show a greater command of language and the influence of reading and book definitions, but on the whole were not strikingly different from those of the children. Four-fifths of the students stated that the word called up a concrete image.

Mr. C. H. King (16) issued the following questions to teachers in the primary, preparatory and public schools of England.

1. One boy met another and noticed that his eyes were red. He said, "You've been crying." Do you think he was right? Why?

2. All cold can be driven out by heat. John Thomas has a cold, so he can be cured by sitting by the fire. Do you agree? Give a reason.

3. There were several clever boys in this class and they were all careless, so a clever boy must be careless. Do you agree with this?

4. French people are excitable and so are Italians, so all foreigners are excitable. Is this true?

The children were divided into three groups namely: A, seven to ten years of age; B, ten to twelve; C, twelve to fifteen. Questions one and two were given to group A, two and three to group B, and three and four to group C.

Two thousand papers were received. From two or three schools the papers were thrown out as they showed effects of coaching. The author thinks that the questions have the following points in their favor. (1) All, or nearly all, appeal to the experience of the children in everyday life. (2) The language is simple. Against them it may be said: (1) The form though colloquial, is in a measure stilted and unnatural. (2) That they are liable to misconstruction (some were misconstrued). (3) That question 2 of I and question 1 of II should have been given to older pupils (per cent of success in answers show this). Question 2 of III appealed too much to the imagination and the logical dealing with the question is frequently interfered with.

		Number of answers.	Per cent of real solutions.
I.	Question 1	39	39.1
	2	26	9.4
II.	1	51	20.7
	2	71	30.0
III.	1	144	44.4
	2	172	56.8

King makes these conclusions: (1) That intellectual bias crops up in a most decided manner irrespective of education or special training. (2) That a considerable portion of those who have received a good education and have reached the age of 15 fail to show anything but the germs of thinking of a logical kind. (3) That education improves the faculty.

He prints a number of the typical answers to each question. While some plainly show that the child has no grasp of the question, in others it is doubtful whether the failure is due to lack of reasoning power or lack of ability to state the answer clearly. Some seem to indicate that the child saw the fallacy but was unable to state it in words.

Ability to deal with generalizations and abstractions depends upon (1) the use of associations acquired by experiences and (2) facility in the use of language. Now the child's limited experience provides him with very few associations and his reasoning ability must be correspondingly weak; his lack of the power of exact or abstract definition is a matter of common observation among those who have taught elementary work in reading and expression.

The weakness of the child's reasoning ability is very well stated in the following observations by Dr. Hall (Adolescence, p. 451).

"Children observe keenly and this involves analysis and regrouping. They are often religious sceptics at ten. They ask why, how and what for in ways that reveal causal ideas. There are all forms of the syllogism in infant mentation. On the other hand children's ideas of size, perspective, time and space, are so narrow and the multitude of their impressions so overwhelming, their superstitions so many, their credulity so great, they are so victimized by sense, so bound down to verbal literalness, their experience is so small, they have so little control of their attention, and their minds are so permeated with error and ignorance, that it is scarcely too much to say that almost up to puberty they can hardly think at all in any proper sense."

Summary

The following conclusions seem now safely established:

I. The Learning Process.
   1. The child requires more time and more repetitions than the adult to learn the same material.
   2. The improvement through practice is less in the child than in the adult.
   3. The loss after practice is less.

II. Memory.
   4. The memory span is less.
   5. Retention is greater (except after first brief interval, 5-20 min.).

III. Attention.
   6. The attention is more inconstant and unstable.
   7. The range of attention is less.

IV. Ideation.
   8. The reaction time of association is much greater.
   9. The child thinks more in individual, concrete ideas, and this ideation is predominatingly visual. Verbal imagery and abstract association are rarer and more common in the dull child.
   10. There is more of the "perseverance tendency" in ideas.

V. Suggestion.
   11. Susceptibility to suggestion is greater.

VI. Reasoning.
   12. The power of abstract definition and logical reasoning is weaker.

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MY MIND AND I AND THE KINDERGARTEN

By Martha MacLear

What a pleasure it must be to have a mind that will "stay put." A mind which is content with things as they are, that is not always asking *why* and *why* and *why*. A mind which is content to travel along the broad highway built by those who have gone before, instead of rushing into all kinds of by-paths, wading in streams and climbing mountains as yet unbeaten by many feet.

To live with such a mind must be conducive to the proverbial bed of ease. But Providence has not endowed me with such a blessing. Willy-nilly, my mind insists upon asking *why* and *why* and *why*. In vain I say, "Because we have always done so." Mind replies, "That is no reason at all, let us improve although we have to break a new path in order to do so." So when mind began to cogitate upon the kindergarten I knew the "game was up."

In regard to the value of the kindergarten, opinion may be roughly divided into that of belief in it as a vital part of education, and that of entire disbelief in any value that it may possess.

Mind believes in the kindergarten as being the most important part of education and the part most advanced toward an ideal of freedom in self-control. But could it not be improved? Why rest content with things as they are?

Recently we have been studying, again, the education of the Greek people. Never have we been so impressed with the glory of their creative ability and the power of their freedom of thought; their development of individual initiative subordinated to the welfare of the city state. Never has the appeal of gymnastics and music, as interpreted by them, been so alluring. Here was mind's opportunity—why not adapt such a splendid education to the kindergarten?

The place to begin such a radical reform would be, of course, with the Superintendent of Schools and the Board of Education. Without their co-operation and persuasive influence on the community, the parents would believe that the school had gone mad. It would be too much to ask that the Board and the Superintendent themselves return to the bright joyousness of Greece. No stretch of the imagination could

compass that picture. But, if they would not dance themselves, doubtless they might be led to see the value of such practices for the children.

Suppose they did, then what? The joy of experimentation for one thing, the pleasure of hewing a new path from ignorance to knowledge; the elation of the searcher after truth. And the joy of watching the children develop each his own personality and reach a measure of self-expression through creative effort while learning to subordinate himself to the welfare of the whole. The only drawback—the apprehension of what would happen to the children when they entered the average first grade.

Gymnastics and music do not sound very educative, or capable of making a well-rounded programme. Let us see how it would work out.

On first coming to school the children would take off their shoes and put on soft sandals. In hot weather, the stockings, too, might well be removed.

Whenever the weather permits the gymnastics or some other work should be given out of doors. At least half of the morning should be spent in the open air. There is always a school yard and, sometimes, a small park which could be used.

The morning would run something like this: Morning prayer and greeting—a short talk between teacher and children—each one expressing his ideas freely;—singing, alone, by twos or threes and all together;—playing with the voice—singing without piano or teacher.

Next, with all the windows open, or better, in the open air, rhythms, or games or dramatized stories.

Time for lunch has come. While some children set the table, some prepare the lunch, and all eat together of the simple fare. The clearing up will take time and patience on the teacher's part. But the gain in self-control and self-reliance in the children would warrant it.

The story hour comes apace, when the children group themselves around the teacher anyway they like,—the freer the position the more conducive to elasticity of thought in hearing and telling stories.

There is just time left for some work at the tables. It may be painting or clay modeling or freehand folding and cutting. It may be work at the sand-table or on the floor playing with the blocks. It may be play with the doll's house or the making of furniture for it. It may be work in the garden or an excursion to some point of interest. Then the children gather for their good-bye song and school is over.

Such a radical change in practice would necessitate a change equally as radical in material. Instead of laying one tablet with its edge to the point of another tablet, the children would learn through dishwashing and table setting, to idealize a homely task, also that steadiness of hands and feet are necessary to success. If a symbolic meaning is desired, the dishpan may stand as a type of the universality and intrinsic value of woman's work.

There would be no time to count the faces and the edges of a cube, or to make symmetrical patterns with seeds or lentils; no time to make pictures of houses with sticks, for we should be too busy building homes. There would be no time to look at intricate pictures, poor in art, painted by a sign-painter in Germany, when the pictorial wealth of all the centuries is available. Many songs could not be learned for we should be too busy learning to sing and speak properly. Elaborate, symbolic games could not be played, for we would be too young to apprehend them. Also we would be too busy to sit for half an hour in order that we might fold two paper circles.

But there would be time to build, to draw and paint, to make a house and the furniture and rugs for it; time to tell and retell the best of all kinds of stories, thus gaining a wealth of new ideas and mental pictures; time to express in voice and body the message that music has for us; time to learn to move with freedom among moveable furniture; time to learn to consider the rights of others and to express one's own desires; time to learn of the outside world and to develop sympathy through participation, in miniature, in its activities; time to develop the body through proper food, fresh air and exercise; time to learn to love nature through excursions and gardens. Surely these things are worth doing, even though we break away from some traditions in doing them.

It may be claimed that all this is nothing new. Maybe it is not. I am accustomed to the viewpoint that all virtue is found in Froebel's philosophy. But the emphasis is new, and here is where the difference lies. To stress gymnastics and music, apprehended in the sense in which the Greeks used them; to minimize the occupations and eliminate the gifts, is a radical departure from precedent. So radical, in fact, that few kindergartens would even discuss it. If such discussions would only take place, we might hope for a renaissance in the best and most vital part of our educational system.

"DOG LATIN" AND SPARROW-LANGUAGES USED BY BALTIMORE CHILDREN

By Leonard Keene Hirshberg, M. A., M. D., Johns Hopkins University

The children of Baltimore who range in ages from five and six years to twelve and fourteen years use a number of secret languages to communicate with one another. In order to prevent other children from understanding what they are saying, they add simple monosyllables as prefixes or suffixes to each spoken word.

When my sister and I were children, she and her girl chums had one set of these sparrow-languages, while my boy friends and I had a dozen others each different from those of the girls, and also widely different from each other. The Baltimore children of to-day call these secret lingoes "dog Latins," we did the same twenty years ago.

These secret languages are used by the youngsters in some such fashion as this. A child wishes to invite another to a birthday party and does not care to have the others know about it. They have already arranged their suffix syllable. It may be "la," "ly," 'y," "ki," "ve," or similar ones. One I heard recently was this.

"Will*ve* you*ve* come*ve* to*ve* my*ve* birth*ve*-day*ve* part*ve*-y*ve* next*ve* week*ve*?"

"Ifve myve mothve-erve willve letve meve."

"Askve herve. Itve isve Mon*ve*day*ve* nightve."

"Allve rightve."

The translation of this is perfectly apparent when written; it is not so simple when rapidly spoken unless you previously have the key in the extra syllable "ve."

Sometimes each syllable of English has the *"Dog Latin"* syllable added to it. At other times the secret vowel sound is only added to an entire word, no matter how long it is.

Yesterdayo Io hado myo marbleso outo to*o* the*ó* country*ó*."

This gibberish seems manifestly too plain to be secret, yet I have heard children converse thus with great mystery for a half-hour and more. The behavior of children under these conditions, indicates that there is a response to something more than mere mystery or secretiveness. There are included,

elements of responsibility, dignity, superior knowledge, the pleasure of play combined with a whetting of the "intellectual" appetite.

The sparrow lingo that contains a prefix instead of the suffix lends itself to many more difficulties than the other and commoner vowel sounds. Older children at times employ the prefix in their "Dog Latin," but even they as soon as they get into deep water, quickly tire of it.

The other day two children, one eleven, the other thirteen, hazarded this bird talk. The prefixed vowel sound, it will be observed, is unusually clumsy.

"Mad*I* mad*am* mad*going* mad*to* mad*the* mad*moving* mad*pictures* mad*to* mad*day.*"

"Mad*I* mad*can* mad*go* mad*if* mad*I* mad*want* mad*to,* mad*but* mad*I* mad*am* mad*going* mad*to* mad*my* madgrandmothers."

Baltimore children as a rule regard these secret languages as something much more serious than a pastime or mere play. This is evident because they may be heard to use the talk while playing indoor as well as outdoor games. It is instructive to observe children as they talk. Not long ago I was tempted to—and did—lift off an auxiliary telephone receiver, when I heard a twelve year old child hold a conversation with a little girl of her own age, as nearly as can be recalled like this. The suffix is "ly."

"Arely youly comly-ingly uply toly playly?"

(The reply was here unheard.)

"Ally rightly forly youly."

"Ily can'tly helply itly. Itly isly notly myly faultly."

"Canly Ily comely downly?"

"Ily willly askly maly-maly."

"Nevly erly mindly, Ily havely toly takely aly naply anly howly. Comely uply asly soonly asly youly canly."

"Allly rightly. Goodly byly."

These languages of childhood seem to be much more usual among the youngsters of Baltimore than in other neighborhoods. It therefore seems to be instructive and desirable to bring these languages to the attention of mothers and educators.

ECONOMIC REASONS FOR VOCATIONAL EDUCATION

By Jonathan F. Scott, Altadena, California

A study of the history of education reveals the fact that educational movements and educational systems are, in far greater measure than is generally realized, the outgrowth of social and economic conditions. Education is the attempt of a civilization to perpetuate what it believes to be most vital in itself. This attempt is sometimes so successful, however, that a type or a phase of education often persists beyond its time of real usefulness. Suited to the conditions of one period, it has little value in a later age when the social forces that gave it birth have passed away. The study of rhetoric at Rome, of intense practical value in the time of Cicero, when the state needed orators to defend its liberties, became the useless ornament of a decadent nobility when the Roman Empire fell under the sway of the imperial hierarchy. When a type of education has thus persisted and lost its value there comes, sooner or later, the demand for a readjustment to the life of the times and the construction of a new type, or types which will more perfectly mirror the age.

Such a readjustment is taking place to-day in America; there is a deep-seated demand that education be brought in touch with "life." Much under discussion at the present time is the movement for further vocational education, which some believe to be a passing fad, others the product of enduring causes of varied character—psychological, sociological, and economic. The aim of the present article is to examine certain of the economic factors underlying this movement and thus to show that in future this type of education is likely to be of greater importance than some of its most ardent admirers now realize.

Among the factors that render probable the general adoption of a great system of industrial and technical education are the following: 1—the present difficulty of obtaining skilled labor; 2—the passing of the American frontier; 3—the growing competition between American and foreign manufacturers; 4—the dependence of national power upon industrial strength, a matter which is likely to become more important in the future because of the position which the United States has

taken as a world-power; and 5—the general tendency of a civilization to perpetuate what it believes to be most vital in itself; a tendency seemingly exemplified in the value attached by modern society to material well-being with the not impossible crystallization of this point of view in a new type of education.

Of the present demand for an increase of skilled labor, little need be said here, as much has already been written on the subject. American manufacturers claim that there are "no expert journeymen, second hands, foremen," [1] and that the great mass of workingmen are lacking in what may be termed "industrial intelligence."[2] At an earlier date skilled mechanics were drafted from the American small shop to the factory, or were obtained from Europe; but no longer can the manufacturer count on these two sources of supply.[3] The small shop is becoming more and more an institution of the past and the tendency in almost every field of production is toward larger manufactories and the combination of these in gigantic corporations. The all-around skill and fineness of execution resulting from the apprenticeship training of the small shop are therefore becoming increasingly rare.

The change in the character of immigration from Europe, has cut off a once fertile source of supply of trained mechanics. Early immigration to America was largely from northern and western Europe and included a large proportion of skilled workmen. Immigration from this part of Europe has ebbed during the past thirty years[4] and a new tide has set in from the southeast. The new element includes a far smaller proportion of skilled labor than the old.[5]

The policy of labor unions, also, has frequently been opposed to the production of a large number of skilled workmen. "Union after union limits the number of apprentices,"[6] and the manufacturers claim that this restrictive policy "has hastened the advent of the trade school many years."[7] Since Europe and the small shop no longer furnish a large supply

[1] Report of the Massachusetts Committee on Technical and Industrial Education (1906), p. 90.

[2] Ibid., p. 4.

[3] Carlton, Education and Industrial Evolution, p. 199.

[4] In 1882 27.7% of our total immigration came from Great Britain, in 1905 10%. The number of persons emigrating from Germany to America decreased from 250,630 in 1882 to 37,564 in 1905. Commons, Races and Immigrants in America, p. 71; Ibid., p. 69.

[5] Ibid, p. 108.

[6] Report Massachusetts Committee on Technical and Industrial Education, 1906, p. 89.

[7] Proceedings of the 1906 meeting of the National Association of Manufacturers of the United States of America, p. 50.

of skilled labor and since the unions limit the number of apprentices, the manufacturer is in a quandary as to where to find the expert workmen that he needs. A system of industrial education seems to him to furnish a solution of the problem.

It may be asked why the manufacturers should not themselves furnish this industrial training, since their interests are concerned so closely; some of the larger establishments have, indeed, equipped apprentice schools of their own to meet the situation.[8] But there are certain reasons why the entire solution of the problem cannot safely be entrusted to the manufacturers. In the first place under the factory system the division of labor has been carried to an extreme—further in America than in any other country[9]—and the manufacturer's temptation to subdivide labor is so strong that there is a constant tendency to perfect the youth in one or two processes rather than spend time and apparently waste money in teaching him all processes. In the next place so great has become the mobility of labor in modern times that the individual manufacturer is apt to feel that it is of little advantage to him to educate boys, who, once trained, may leave him to enter the employ of a rival concern. The manufacturer is primarily interested in the development of his own business rather than in the welfare of the American boy. Those who advocate a return to the medieval system of apprenticeship should remember that under modern industrial conditions there can be little of that comparative identity of economic interest and those close personal relations between master, or manufacturer, and apprentice, upon which so much of the success of the institution once depended. For economic reasons, if for no other, society cannot afford to look solely to the manufacturer for a solution of the problem of industrial education.

The passing of the frontier affects tremendously the development of the United States. Until comparatively recent times there was a steady stream of colonization westward to take up the free or the cheap lands of the pioneer regions. It required but little capital for a man in the East to get together his belongings, leave his home, transport his family and goods by water or prairie schooner to the great west where land was plentiful and fertile, where independence and comfort were well within the realms of possibility. The Western claim meant hope to the discouraged, satisfaction to the discontented, opportunity to the ambitious. The westward move-

[8] Wright, Carroll D., The Apprenticeship System in the United States.

[9] Commons, Races and Immigrants in America, p. 124.

ment also reacted favorably upon the east, for it drained off the surplus population, thus lessening competition and keeping up wages. In general, life was freer and easier in America than in the more crowded countries of Europe.

During the past twenty or twenty-five years the cheap lands have become far less plentiful than in earlier days. In the year 1889, when the rich territory of Oklahoma was about to be thrown open to occupation, thousands stood on the border, waiting for the signal to be given that they might rush in and stake out claims. During the decade 1900 to 1910 the prices of farm lands in many of the states rose enormously.[10] Cheap lands, then, can no longer be counted on as a vital force to aid us in the solution of social and economic difficulties. The great problem presented by the passing of the frontier is this: How are we to provide adequately for our constantly and rapidly increasing population? The success of Germany in dealing with a similar, but more difficult, situation points out one answer to the question. Fit the individual for his proper place in life and increase the total wealth of the country by means of an education along industrial and technical lines.

The passing of the cheap lands is bound to give an impetus to the movement for scientific agriculture. In the early days the pioneer farmer could afford to exhaust the soil rapidly by his crude methods of agriculture and then move on to new and more fertile lands. Once the land ceases to be cheap this process becomes impossible while the competition of the pioneer farmer grows less formidable to the scientific farmer of the east. There must now be an intensive development of the soil similar to the development in Germany fostered by scientific agriculture. "Hereafter," says Carver, "there will be a higher premium upon intensive and scientific farming than there has ever been before. So long as there was free public land to be had for the asking the opportunities for the scientific farmer were limited by the possibilities open to the pioneer farmer, who needed nothing but a team and a few implements and a very meager equipment in the way of knowledge to en-

[10] Percentage of increase in value of farm lands in certain States:

Alabama, 116.1.	Minnesota, 72.8.
Arizona, 475.8.	Missouri, 104.3.
Illinois, 105.8.	New York, 32.0.
Iowa, 127.2.	Ohio, 57.9.
Massachusetts, 32.8.	Virginia, 100.8.
Washington, 278.3.	

Compiled from Year-book of the Department of Agriculture for 1910, pp. 499-596.

able him to grow crops successfully." [11] A great development of experiment stations now becomes possible which would have been practically impossible fifty years earlier "because of the lack of opportunity for the use of scientific knowledge in competition with pioneering." [12] Thus the movement for the scientific study of agriculture has behind it a powerful influence in the passing of the frontier and the consequent need for an intensive development of the soil.

But the scarcity of cheap lands reacts also upon industrial conditions in the cities. As the expense of purchasing a farm becomes greater the natural tendency of the worker is to turn to industrial life for his means of support.[13] All the garish attractions of the modern city urge him in the same direction. The surplus population instead of being drained off to the West tends to take up its abode in the cities. The natural tendency of this is to increase competition and thus lower wages in industrial pursuits. At the same time the rise in the price of land tends to raise the price of agricultural products, making the cost of living greater for all classes in the towns. The struggle of the future will be far more severe than that of the past unless something is done to relieve it. The economic efficiency of all workers is becoming an economic necessity. The need for industrial education in America has therefore never been as great as it is now.

The economic leads to the moral problem. According to Prof. Carver, scarcity forms the economic basis of evil. "where there is scarcity there will be two men wanting the same thing; where two men want the same thing there will be an antagonism of interests; where there is an antagonism of interests between man and man there will be questions to be settled—questions of right and wrong, of justice and injustice—and these questions could not arise under any other circumstances. The antagonism of interests is, in other words, what gives rise to a moral problem." [14] According to this

[11] Carver, Principles of Rural Economics, p. 109.

[12] Ibid, p. 110.

[13] Figures on occupations taken from the Twelfth Census Reports (Volume on Occupations, p. L.) show the trend toward industrial and commercial work.

	1870.	1880.	1890.	1900.
Number engaged in Agricultural Pursuits	5,948,561	7,713,875	8,565,926	10,381,765
Trade and Transportation	1,244,383	1,871,503	3,326,122	4,766,964
Manufacturing and Mechanical Pursuits	2,677,765	3,784,726	5,678,468	7,085,309

[14] Carver, The Basis of Social Conflict, Papers and Proceedings of the American Sociological Society, Vol. II (1907), p. 13. The development of vice, however, can scarcely be said to be wholly dependent upon scarcity.

theory greater scarcity of land will bring growing antagonism of interest and hence moral problems more and more difficult of solution. One of the methods of alleviating this situation brought about by scarcity is to increase production.[15] Vocational education, then, in so far as it increases production, aids in satisfying the wants of man and helps to solve the moral problem.

In general, America is facing the difficulties—economic, social and moral—of a more crowded environment. Vocational education is one of the means for meeting this situation.

The recent and rather remarkable increase in the exports of American manufactures furnishes another reason for further industrial and technical training. In 1880 the United States held fourth place among the countries of the world as an exporting nation; in 1900 she ranked first.[16] In this development of our export trade, manufactures have played an increasingly important part, as the following table illustrates:

Percentage of manufactured goods in total of exports.[17]

1860	12.7	1890	17.8
1870	15.0	1900	31.6
1880	12.5	1905	35.8

As the population of the United States grows, the supply for exportation, of certain raw materials, such as wheat, must diminish. "The future appears to belong" to manufacturers.[18]

If, then, the American manufacturer feels the need of vocational education for his employees when he competes only with his fellow-countrymen he must feel it far more keenly when he has to face on foreign ground the competition of other countries where systems of industrial and technical training are already established. Since the cost of many kinds of labor in America is so great as compared with other countries,[19] and since the natural resources of the country cannot be exploited by individuals to the same extent as formerly, the manufacturers of the United States can ill afford to neglect, in competition with their foreign rivals, so strong a weapon as vocational education.

[15] Carver, The Economic Basis of Evil, Harvard Theological Review, Vol. 1, p. 110.

[16] Bogart, Economic History of the United States, p. 454.

[17] Ibid.

[18] Coolidge, United States as a World Power, pp. 177-8.

[19] Great Britain, Board of Trade, Report on the Cost of Living in German towns, p. lii; United States, Bureau of Labor, Digest of Report of British Board of Trade on Cost of Living in the Principal Industrial Towns of the United States, pp. 58-59.

It was on their return from the St. Louis Exposition of 1904 that the German visitors to America reported to their government that American competition was not to be taken seriously. Possessed of great natural vigor and physical resources, Americans were over-confident, self-satisfied and did not realize the need of concerted action to produce greater efficiency. The Germans pointed out the lack of a system of industrial training and spoke of the "reliance on a general and more or less superficial education."[20] One thing the foreigners failed to realize—the readiness of Americans to remedy defects once they are made clear. The Germans themselves kindly pointed out one of these defects.

As the competition among individuals is growing constantly, so the struggle of the nations for power is ever increasing in intensity. At the present time this struggle is before everything else a contest for territory. "The nineteenth century has been an age of nationalism. The twentieth is to be the age of national imperialism."[21] It is not merely the American frontier that is disappearing; the free lands of the world are being brought under the jurisdiction of the powers as rapidly as possible. The diplomatists of London, Paris and the Wilhelmstrasse are ingratiating themselves with the weaker nations of the earth, while they watch one another with cat-like eyes, ready to checkmate a move of any one of their number toward territorial increase. For this international rivalry, with the possibility of war, the great states of the earth must be fully prepared.

Now the modern nation holds that its power depends largely upon the extent of its resources and the skill with which these are developed. "Money is the sinews of war." The smaller the territory, the greater must be the skill in the development of national resources. Only through the utmost forethought and ingenuity has Germany been able to maintain her huge army and powerful navy, to hold most of her rapidly increasing population within the borders of her limited territory. The world stands amazed at Germany's economic development and military strength, and asks how all this has been brought about. Many answers have been given but opinion seems to be strong that industrial and technical education have had much to do in the attainment of this result.[22]

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[20] Person, H. S., Industrial Education, pp. 4-5.

[21] Reinsch, World Politics, p. 3.

[22] Alderson, V. C., The Need of Technical Education, p. 4; Proc. National Association of Manufacturers for 1910, pp. 276-277; Blondel, L'Education Economique, p. XXI; Ware, F., Educational Foundations of Trade and Industry, p. 101; Person, H. S., Industrial Education, p. 13; Hanus, P. H.; Beginnings of Industrial Education, p. 21.

Until comparatively recent times the United States has been a spectator of the game of world politics rather than a participant in it. Even to-day her diplomacy is in its infancy. But with the disappearance of the frontier, the war with Spain and the acquisition of island possessions, the United States has become a world-power. The war with Spain "brought new prestige and enlarged opportunities. The occupation of the Philippine Islands has placed the nation on an altogether different footing in the Orient, and it can no longer pose as a disinterested spectator of political changes in that quarter of the globe."[23] The United States, then, has definitely entered the world struggle. Like the other nations of the earth she will tend to develop her strength by all the means in her power; and vocational education is not the least of these means.[24]

It has already been stated that it is the tendency of each age to perpetuate by means of educational institutions those things which it believes to be most important. Thus the education of the Spartan was military because war and the preparation for war were the chief factors of Spartan life. The education of the Middle Ages was religious because the spirit of the age was religious and the Church was the great social force. Latin and Greek formed the staples of study during much of the modern era because of the combined influence of the Renaissance and Reformation. The Renaissance saw in the classics the great sources of culture, saw in them also the great storehouses of practical information. To the reformers, Latin and Greek, with Hebrew, constituted the keys for unlocking the Scriptures and for getting at the commentaries thereon. So the school curriculum was dominated by these studies. Examples of this adjustment of education to the spirit of the times might be multiplied from history.

Now, it is the opinion of many that the modern "Zeitgeist" is dominantly economic, even materialistic in character. Paulsen says "A materialistic view of the world after first taking hold of large sections of the educated classes, is now widely prevalent amongst the masses."[25] The struggle for money and material possessions seems to play a greater part than ever

[23] Latané, America as a World Power, p. 319. See also Coolidge, United States as a World Power.

[24] "That nation," says Victor C. Alderson, "which neglects to equip its workmen with the armament of industry—technical education—will surely be defeated and become a decaying nation." Alderson, V. C., Technical Education an Economic Necessity, p. 14. For the value of industrial education in increasing production, see Person, H. S., Industrial Education, Chapter VI.

[25] German Education, Past and Present, p. 175.

before in the world's history. There can be no doubt that the commercial development of the modern era and the industrial revolution of the eighteenth and nineteenth centuries have distinctly colored our present civilization. If we admit the great value attached by modern society to economic as compared with religious, æsthetic, or purely intellectual considerations, then it follows that our age will be likely, sooner or later, to construct a type of education more distinctly economic, more practical in character, than the present system. Such an adjustment has already begun in the movement for vocational training.

All this indicates that the movement for vocational education is no mere fad, but a response to important needs of modern civilization. The demand of the manufacturer for skilled labor is far greater than the supply, and, under modern industrial conditions it is difficult and often unprofitable for him to train adequately his apprentices. As the American manufacturer competes more and more with foreigners in the markets of the world he must reduce the cost of production and enhance the quality of his goods. The far-sighted manufacturer, therefore, asks for industrial education. From the point of view of the workingman industrial education is becoming more and more necessary with the passing of the cheap lands. He must be thoroughly equipped in order to win in a struggle made fiercer by a more crowded environment. From the point of view of the nation, vocational education is necessary that national efficiency may be increased and our country hold its own in the world-struggle. Thus the future of this type of training seems assured.

THE COMING INTERNATIONAL CONGRESS ON SCHOOL HYGIENE

The First International Congress on School Hygiene was held in Nuremberg in 1904 with a membership of 1247 persons. The participants in the Congress represented twenty-four different countries, and the papers were presented in three different languages. The report of this Congress, with a total of over 170 papers, contains the proceedings of the largest and most eminent body of hygienists that had ever gathered to consider the special subject of school hygiene. The scope of the papers illustrates well the wide expansion of school hygiene in recent years. Only about one-eighth of the time of the Congress was taken up with school hygiene in the narrower sense,—school organization, heating, ventilation, and the like. The larger part of the report is filled with papers on school diseases, the hygiene of instruction, the hygiene of the school child, the hygiene of the teacher, and the like. Perhaps a score of the speakers presented the results of original experimental or statistical investigations. The Second International Congress was held in London in 1907; the Third, in Paris in 1910, and the reports of these congresses also are important contributions to the literature of school hygiene.

The Fourth International Congress of School Hygiene is to be held in Buffalo August 25-30 of this year. This should be an event of great importance in the history of American education. The executive committee have made extended preparations for a scientific exhibit of hygienic apparatus and for an elaborate program. The colleges and universities of the country, the municipalities, boards of health, school boards, the woman's clubs, and similar organizations, are entitled to appoint delegates, and a large number of visitors from abroad are expected. Professor Burgerstein told the writer last fall that he hoped to bring 300 Austrian teachers to attend this Congress.

The President of the Congress is Charles W. Eliot, President Emeritus of Harvard University; and the Vice-Presidents are W. H. Welsh of Johns Hopkins University, and Dr. Henry P. Walcott, Chairman of the Massachusetts Board of Health. The Honorary Vice-Presidents are: Abraham Jacobi, Columbia University; William H. Burnham, Clark University; His Eminence, James Cardinal Gibbons; Philander P. Claxton, U. S. Commissioner of Education; John H. Finley, President of the College of the City of New York; Adelbert Moot, Regent of the University of the State of New York; Sir James Grant, Ottawa; M. Uribe Troncoso, Mexico, D. F.; Rupert Blue, Surgeon General, U. S. Public Health and Marine Hospital Service; H. M. Bracken, Minnesota State Board of Health; Andrew S. Draper, Commissioner of Education, State of New York; Theobald Smith, Harvard Medical School; David Starr Jordan, Leland Stanford Jr. University; Dr. Henry R. Hopkins and Dr. Woods Hutchinson. The Secretary General is Dr. Thomas A. Storey, of the College of the City of New York.

The bulletin of the Congress issued in April gives the names of committees in Austria, Hungary, Belgium, Canada, Denmark, France,

Germany, Great Britain and Ireland, Italy, Japan, Mexico, The Netherlands New Zealand, Russia, Spain, Sweden, Switzerland, and other countries, as well as the United States.

Papers have already been promised by a large number of American and foreign workers in the field of school hygiene. Among the prominent speakers expected from abroad are: Professor Griesbach of Mülhausen, President of the Nuremberg Congress; Dr. L. Dufestel of Paris, medical inspector of the Paris schools; Dr. James Kerr of London; Dr. Max Lobsien of Kiel, Germany; Dr. Altschul of Prague; Dr. Jessen of Strassburg; Dr. Leo Burgerstein of the University of Vienna; Dr. Cecil Reddie of Abbotsholme, England; Dr. Schuyten of Antwerp, and others.

Most of the prominent workers in school hygiene in this country are expected to contribute to the Congress; and special discussions are being arranged on the subjects of mental hygiene, oral hygiene, sex hygiene, school feeding, health supervision of University students, tuberculosis among school children, physical education and college hygiene, Binet-Simon tests, and the like.

An especially important feature planned for the Congress is a scientific exhibit of hygienic apparatus, hygienic conditions, and the like. This is under the direction of a special committee at the head of which is Dr. Fletcher B. Dresslar, formerly specialist in school hygiene in the Bureau of Education at Washington, and now Professor in the Peabody College for Teachers, Nashville, Tennessee.

The citizens of Buffalo are making extensive preparations for the entertainment of delegates. The sum of $40,000 has been collected in that city alone for the purpose of defraying the expenses of the Congress and the reception of delegates. Any one can become a member of this Congress who is interested in the subject and willing to contribute the membership fee, which is $5 for regular members; $2.50 for associate members. Copies of the preliminary bulletin may be obtained from the Secretary.

Teachers and school officials and the general public as well as physicians and specialists in hygiene have an opportunity to show their interest in school hygiene and inform themselves of the recent developments on this subject. Representatives from all the leading countries of the world are expected to be present. The program covers a very broad field. The official languages of the Congress will be English, French, German, Spanish and Italian. The program committee and the committee on the scientific exhibit have made preparations for making this Congress the most important meeting in the interests of child hygiene ever held in this country, and it is hoped that the scientific contributions will be equal in value if not superior to those of any international congress on school hygiene that has ever been held.

The importance of the subject of school hygiene has received tardy recognition, but this Congress, it is hoped, will show teachers and school officials and the general public the real significance of the subject and emphasize the urgent need for extended medical inspection in the schools of this country and reform of school work and school conditions with regard to the facts of hygiene. As pointed out by the officials of the Congress in a recent communication, the results of medical inspection in the schools indicate that of all pupils 26 per cent suffer from eye strain; 6 to 12 per cent have enlarged tonsils; 12 to 24 per cent, some nasal obstruction; 2 to 5 per cent, defective hearing; 50 to 75 per cent, decayed teeth; 10 to 30 per cent, nervous disorders; 5 to 20 per cent, some deformity; 1 to 15 per cent, skin diseases; 1 to 67 per cent, pediculosis.

The result of the prevailing ignorance and lack of training on the part of teachers has resulted in grotesque and almost criminal errors in many schoolrooms. The teacher has been trained to look at the scholastic product instead of at the children. Their attention has been so absorbed in the writing books, the products of manual training, the notebooks filled, the examples solved in arithmetic, and the like, that they have had no time to notice the overheated rooms, the bad odors, the deformed posture of the children, the strained eyes and the various defects by which the pupils are handicapped. In some schools it has actually been true that teachers have urged children to come to school in spite of contagious disease; and failing to recognize defects of sight and hearing and the like, by which children are handicapped, they have done gross injustice to the defective; and sometimes the children themselves have recognized the unhygienic treatment and could have instructed their teachers in regard to the proper treatment of their fellows.

The need of better training of teachers in school hygiene can hardly be emphasized too strongly. Of all absurdities of modern education nothing perhaps is greater than the neglect of this subject in the normal schools. In recent years it is true that this subject is usually given some attention in connection with school management or other subjects; but a special course with a competent instructor should be given in every training school, and teachers should be made familiar with the fundamental facts established by modern hygienic studies. This is essential not merely that teachers may help in the early detection of school diseases and the like, but also that they may have an hygienic apperception and be trained to notice unsanitary conditions in the schoolroom, improper habits of pupils in school work, conditions of fatigue, nervousness, and the like, and be able to contribute to the positive aim of modern hygiene,—the training of children in habits of healthful activity both physical and mental.

All organizations concerned with hygiene and education,—the National Education Association, the American Medical Association, and the special organizations for child welfare; State and city Boards of Health, State Boards of Education, and the various charitable organizations; the innumerable miscellaneous clubs and societies for education and child welfare; especially normal schools and other training institutions that are awakening to the need of introducing school hygiene; and other organizations whose work is dependent on intelligent public interest in child hygiene,—all have now the opportunity to help arouse the public to proper appreciation of the importance of this subject, and may anticipate help from this congress.

W. H. B.

BOOK NOTES

Modern philanthropy; a study of efficient appealing and giving, by WILLIAM H. ALLEN. New York, Dodd, Mead & Co., 1912. 437 p.

This is a most interesting and important book. Mrs. Mary W. Harriman, wife of the railroad magnate, received over 6,000 appeals for help, and desiring to take the wisest course, turned most of these letters over to the author, who is director of the Bureau of Municipal Research and the National Training School for Public Service, who has studied these letters and told us that 3,000 of these individuals wanted in all $22,000,000; organized activities wanted $207,000,000; schools and colleges aggregated $54,000,000; hospital and health, $83,000,000; homes and asylums, $6,000,000; civic work, $120,000,000; churches, $121,000,000. The map shows the distribution of these letters, which follows somewhat the density of population. We are told how these people came to write them, all the ruses, methods of approach, workmanship of appeal. Then we are told about the difficulties in the art of giving, the endowment dream, need of a national clearing house for givers, clearing standards of appeals, and finally, a magna charta of givers. There are many illustrations and the work, like everything else from Dr. Allen's pen, is fresh and comes directly from and goes to the heart of the matter.

The theory of evolution in the light of facts, by KARL FRANK. With a chapter on ant guests and termite guests by P. E. Wasmann. Translated from the German by Charles T. Druery. London, Kegan Paul, Trench, Trübner & Co., 1913. 241 p.

These authors present here a very interesting and profound discussion of the general principles of evolution, which owing to their position is more like an authoritative pronouncement of the Catholic church upon the subject than anything we have yet had. The authors, who are Jesuits (at least the first of them) are very able scientists of high rank in their own domain, and they have gone over very carefully the questions treated and come to the general conclusion that the manifold alterations of plants and animals never goes so far that the allocation to a certain type cannot be made with great certainty, whether it would be adult or embryological, and the alterations in fossil organisms are of the same kind. The remarkable thing is the rule, viz., that each organism breeds true, while current evolution of the Darwin-Haeckel type is only one of "approximating valuation" which has led us in the wrong direction. Theories of evolution will always remain "since everything points to the fact that there was and is an evolution in the organic world," but this does not express itself in the impossible spontaneous leaps from inorganic to organic or from plants to animals, nor in objectless hither and thither variation, but there is a constant harmony between construction and function and the external conditions of life. "Life was not acquired by organisms themselves nor were the evolutional tendencies." Both were received from another source, from the Creator.

A guide to the Montessori method, by ELLEN YALE STEVENS. New York, Frederick A. Stokes Co., 1913. 240 p.

The author pleads as an excuse for adding another to the Montessori books, the growing interest in England and America in this remarkable woman. We are first told about the founder of the school, then the controlling ideas, then later chapters discuss self-discipline through obedience, the two-fold aim of education, viz., biological and social, physical, sensory education, from sensations to ideas, the three R's in a new form, the Montessori parent, teacher, movement, its critics, its deeper message, suggestion for the summer and for the suburbs. On the whole we think this book justifies its existence, but we sincerely hope that the excessive adulation of the author and the fervid zeal with which her cult is now developed will not bring any serious reaction that will interfere with such merit as it has, which in our opinion has been vastly over-estimated.

Mind and health, with an examination of some systems of divine healing, by EDWARD E. WEAVER. New York, Macmillan, 1913. 500 p.

The author first discusses the mind, conscious and sub-conscious, then the psychological principles of psychotherapy and its armamentarium, its technique, value, reality in general and religious reality, religious systems of mental healing, of which the author makes five, viz., Christian science, the Emmanuel movement, divine healing of the Dowieism type, the Christian alliance type, and fifth, metaphysical healing, the demands of a valid religious system of healing, what constitutes it, how the church may heal. The author has a good bibliography and an index of names and subjects. This is a very painstaking work which it must have taken long to write and it will be of great use and interest to those concerned with the subjects it treats. From the standpoint of the writer of this note, it leans a little too sympathetically toward movements like Emmanuelism and the English Psychic Research Society. Yet the facts are the main things and the author fortunately for the reader keeps the two quite distinct throughout.

Medical inspection of schools, by LUTHER HALSEY GULICK and LEONARD P. AYRES. New York, Charities Publication Committee, 1913. 276 p.

The first edition of this work, printed in 1908, was exhausted within three months, and was reprinted the next year. During the three and a half years since, there has been much increase in the number of cities having medical inspection and physical examinations have become a more integral part of the system, so that there is an increasing demand for a revision so that we are told that "while covering much of the matter in the original book" the text has been entirely rewritten and the description of methods and forms as well as the quantitative material brought down to date.

The posture of school children, with its home hygiene and new efficiency methods for school training, by JESSIE H. BANCROFT. New York, Macmillan Co., 1913. 327 p.

The chapter headings, erect carriage, how to judge and correct it, the spine, head, chest, shoulders, feet, home hygiene of posture, that of dress, efficiency methods, class standards, auxiliary aids, give a rather inadequate conception of the content of this popular and copiously illustrated book, with 26 plates and 108 figures illustrating various postures and the modes of correcting defects. The author

is an assistant director of physical training in the New York public schools and the book is addressed to the corps of special assistants. The book is useful and timely.

Culture, discipline and democracy, by A. DUNCAN YOCUM. Philadelphia, Christopher Sower Co., 1913. 320 p.

The author first gives the present status of his subject, then analyzes formal discipline, discusses conditions favorable for general discipline, the old idea is gone and the old value of formal subjects, the interdependence of culture and direct preparation for life, uniformity for various localities in the general course of study is limited by educational relationships which must be certainly memorized, the inadequacy of tests for the mere elimination of the harmful, tests for relative worth.

National Education Association. Report of the committee on teachers' salaries and cost of living. ROBERT C. BROOKS, executive secretary. Published by the association, Secretary's office, Ann Arbor, Mich., 1913. 328 p.

The papers here are roughly grouped under the increased cost of living, its causes, with letters and references; while the second part deals with economic and social conditions of teachers in certain large mid-west cities; the third with salaries, schedules, tenure and pensions. Reports like this ought to be analyzed and the main points brought out a little in perspective like the excellent work of this sort which is often done in the Parliamentary blue books of England. Through these 328 pages the reader is left almost no guide as to what is really worth hunting down and what not.

School feeding; its history and practice at home and abroad, by LOUISE STEVENS BRYANT; with an introduction by P. P. CLAXTON. Philadelphia, J. B. Lippincott Co., c. 1913. 345 p.

This work is dedicated to Professor Lightner Witmer and bears what appears to be a very hearty and official endorsement from the United States Commissioner of Education. After a chapter on the history and present status of the school feeding movement, the writer proceeds to discuss physical deterioration, malnutrition in England, provision of meals in elementary schools there, the canteen *scolaires* in France, school meals in German municipalities and other European countries, lunches in American elementary schools, in open air schools, investigation on hand feeding, malnutrition in childhood, food needs of growing children; and adds school menus, bibliography, appendices.

School janitors, mothers and health, by HELEN C. PUTNAM. Easton, Pa., American Academy of Medicine Press, c. 1913. 201 p.

This work has three chapters, the first on the prevention of school fatigue; the second, mothers' clubs and clean schoolhouses; the third, school janitors and health. The chief value of the book is in the last chapter and the author's ideals would make janitorship almost a profession.

The moral education of school children. By CHARLES KEEN TAYLOR. Preface by Arthur Holmes. C. K. and H. B. Taylor, Mermaid Lane and Navahoe Streets, St. Martin's, Philadelphia, n. d. 77 p.

This little book is called an expression of the general movement represented by the principle that a bad body makes a bad boy and a good body makes a good boy. The author gives a moral education

schedule for use in the schools designed for children from five to sixteen years, inclusive, tabbing off a number of different virtues for each age, with a few lines of comment on each. This and part three, which is really a note on working children, constitute the main value of the book.

The progressive business man, by ORISON SWETT MARDEN. New York, Thomas Y. Crowell Co., 1913. 166 p.

Among the eighteen chapters the following are typical: What will system do for you; prosperity; put sunshine into your business; capital and labor; what you owe your employees; sweetening the day's work; a better spur than the whip; the new business philosophy; looking outside for grants; integrity; when the head of the firm takes it easy; courtesy brings business; looking the latter in the face; don't fire the boy; the tight wad employer; suspicious mental attitude; why men fail.

The joys of living, by ORISON SWETT MARDEN. New York, Thomas Y. Crowell Co., 1913. 403 p.

We have here twenty-six chapters on such subjects as: A professional at living, ethics and happiness, the sin of tired nerves, joy of imagination, friendship, reading, content, home joy killers, joy at work, longevity and happiness.

Old age, its cause and prevention; the story of an old body and face made young, by SANFORD BENNETT. New York, Physical Culture Publishing Co., c. 1912. 394 p.

Here is a man of seventy-two, who has, as his photographs show, rejuvenated himself from the old man he was at fifty so that he does not look, as he thinks and tells us his friends do, over forty. The photographs of his physical development are certainly very remarkable. His shoulders, chest, back, legs, are those of an athlete, and although he has not much to boast of in the way of health and longevity from his parents, and began with a mild heart trouble, he is now a man of admirable physical development. All or nearly all his exercises are taken in the morning, horizontal, in bed, after he wakens. He has very little apparatus and besides the exercises which have so greatly improved his heart and overcome his varicose veins and increase his chest capacity, he has a number of other friction exercises for his face, from which all wrinkles have been rubbed out, and he tells us and indeed the photographs indicate that he has even brought back a good deal of his hair and eliminated much of its grayness. The language of the book is plain, frank, direct, and it cannot fail to attract a great deal of attention and do much good.

Scientific management in education, by J. M. RICE. New York, Publishers Printing Company, 1913. 282 p.

The author here reprints eleven articles, the chief topics being educational research, obstacles to rational reform, essential of elementary education, economy of time, futility of the spelling grind, the test in arithmetic, the causes of success and failure, results of a test lesson in language, need of a new basis of education, and supervision.

Ethics and education, by J. HOWARD MOORE. London, G. Bell & Sons, 1912. 188 p.

The heads of the important chapters are school and evolution, importance of ethical culture, the call of the past, educational anxieties,

practical, vocational, intellectual and ethical anxiety, can morals be taught, contents of ethics, law of the larger self, causes of immorality, vestigial organs, survivals of the wild, biology of child nature, reforming the curriculum, the world to be, a course in ethical culture, works, methods, suggestions.

Enjoyment of poetry, by MAX EASTMAN. New York, Charles Scribner's Sons, 1913. 224 p.

The various chapters treat of poetic people, names practical and poetic, their technique, imaginative realization, choice and comparison in poetry, wines, sleep and poetry, realization of action, of things, emotions and ideals, poetry itself, how to enjoy and compose it.

The garden city movement up-to-date, by EWART G. CULPIN. London, Garden Cities and Town Planning Association, 1913. 63 p.

This attractive little book gives a tabulated summary of estates, details of schemes, copartnership in housing, with the work of garden cities and town planning associations, with very many tables, views, diagrams, etc., showing the great extent to which the movement has gone in England. The title may easily mislead Americans, who are accustomed to associate garden city only with children's gardens.

Agenda, 1913. Düsseldorf, Tietz, 1913. 96 p.

This little work contains a series of articles by different writers. One is entitled the century of the child, another is on child care and culture, another treats the soul of the child as an individuality, while education in general, the child and art, protective measures, and finally a calendar, constitute this copiously illustrated little book.

The shattered halo and other stories about schools, by C. W. BARDEEN. Syracuse, C. W. Bardeen, 1913. 250 p.

Mr. Bardeen here publishes eight more of his characteristic simple and effective stories of school life and work. It is pleasant to note that these stories seem to improve with the successive publications of the genial author.

A cyclopedia of education, edited by PAUL MONROE. Volume 4. New York, Macmillan, 1913. 740 p.

It is a pleasure to note that the standard set up by the first volume of this work seems to be maintained. This volume comes down to Polytechnic schools.

Healing influences, by LEANDER EDMUND WHIPPLE. New York, American School of Metaphysics, 1913. 227 p.

The Pierce spellers. A two-book course in spelling for grades three to eight, by WALTER MERTON PIERCE. Boston, Ginn & Co., c. 1912. 131 p.

Skolbarns Intressen; en psykologisk-pedagogisk Undersökning, av GEORG BRANDELL. Stockholm, A. V. Carlsons Bökforlags-Aktiebolag, 1913. 256 p.

An introduction to the theory of mental and social measurements. by EDWARD L. THORNDIKE. 2nd ed. rev. & enl. New York, Teachers College, Columbia University, 1913. 277 p.

The modern warship, by EDWARD L. ATTWOOD. New York, G. P. Putnam's Sons, 1913. 146 p.

The Vikings, by ALLEN MAWER. New York, G. P. Putnam's Sons, 1913. 150 p.

Variations in the grades of high school pupils, by CLARENCE TRUMAN GRAY. Baltimore, Warwick & York, 1913. 120 p. (Educational Psychology Monographs, ed. by Guy Montrose Whipple, no. 8).

The atmosphere, by A. J. BERRY. New York, G. P. Putnam's Sons, 1913. 146 p.

Academic algebra, by GEORGE WENTWORTH and DAVID EUGENE SMITH. Boston, Ginn & Co., c. 1913. 442 p.

Burke: Reflections on the French Revolution. Edited by W. ALISON PHILLIPS and CATHERINE BEATRICE PHILLIPS. Cambridge, University press, 1912. 311 p.

The earth, its shape, size, weight and spin, by J. H. POYNTING. New York, G. P. Putnam's Sons, 1913. 141 p.

A first course in physics, by ANDREWS MILLIKAN and HENRY GORDON GALE. Rev. ed. Boston, Ginn & Co., c. 1913. 442 p.

The case for woman suffrage; a bibliography. By MARGARET LADD FRANKLIN. New York, Published by the National College Equal Suffrage League, 1913. 315 p.

Side-stepping with Shorty, by SEWELL FORD. New York, Grosset & Dunlap, c. 1908. 325 p.

Open air crusaders. The individuality of the child versus the system; together with a report of the Elizabeth McCormick open air schools. By SHERMAN C. KINGSLEY. Elizabeth McCormick Memorial Fund, 315 Plymouth Court, Chicago, Ill., 1913. 128 p.

National Education Association. Year book and list of active members, revised to December 31, 1912. Chicago, Illinois, Meeting. Published by the association. Secretary's office, Ann Arbor, Mich., 1912. 429 p.

National Education Association of the United States. Journal of Proceedings and Addresses of the 50th annual meeting, held at Chicago, Illinois, July 6-12, 1912. Published by the association, Secretary's Office, Ann Arbor, Mich., 1912. 1427 p.

Stories for little folks; the princess and the goblin. By GEORGE MACDONALD. Simplified by Elizabeth Lewis. Philadelphia, J. B. Lippincott Co., c. 1913. 124 p.